



## EVALUATION OF DANISH PARTICIPATION IN THE 6TH AND 7TH FRAMEWORK PROGRAMMES

Research: Analysis and Evaluation 2/2010



**Danish Agency for Science  
Technology and Innovation**

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The most recent and most qualified knowledge is a precondition for Denmark to be among the leading knowledge societies of the world. Only a small part of this knowledge is created in Denmark. Consequently, it is crucial that Danish researchers and enterprises take part in international knowledge networks.

The EU's Framework Programmes constitute an increasingly important platform for research cooperation and exchange of knowledge, and for this reason it is important for Danish research to participate extensively in this cooperation.

In recent years, the Government has taken a number of initiatives to stimulate Danish participation in the Framework Programmes. It is gratifying to see that the evaluation assesses these initiatives positively, and it is especially gratifying to see clear signs indicating that Danish participation is well on track towards a high level following some years of declining participation. Thus a basis has been created for Denmark to benefit increasingly from the cooperation in the years ahead.

The participation of small and medium-sized enterprises in the Framework Programmes is decisive for making the knowledge created during the research projects contribute to innovation and growth in Denmark. The report assesses that there may be a need to further strengthen the efforts in this area. Several initiatives have already been taken to promote the participation of small and medium-sized enterprises, the effects of which are not yet known. It will be interesting to follow this particular area in the years to come.

All in all the report contains a series of interesting conclusions and recommendations. As such, the evaluation is a constructive contribution to the future effort of further strengthening Danish participation in the Framework Programmes.

A handwritten signature in black ink, appearing to read 'Helge Sander'.

Helge Sander  
Minister for Science, Technology and Innovation

This evaluation was carried out as part of the intensified evaluation efforts following the agreement on the implementation of the Globalisation Agreement from November 2006. As part of this agreement, the parties (the Government, the Danish People's Party, the Social-Liberal Party and the Social Democratic Party) decided that more extensive follow-up and evaluation are needed in order to focus on the outcome of the large-scale investments in research and development.

Intensified follow-up and evaluation efforts are intended to contribute to documenting the research and development activity, to creating a basis for qualifying future prioritisations, and to assessing effects of the increased research and development investments.

The evaluation was conducted by Technopolis at the request of the Danish Agency for Science, Technology and Innovation. The evaluation was initiated as part of the "Action Plan for Research Evaluation 2008-2010" and conducted in accordance with the Agency's "Guidelines for Research Evaluation". The Action Plan was adopted by the Minister for Science, Technology and Innovation on the recommendation of the Danish Research Coordination Committee (DRCC).

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Prepared by

technopolis<sub>[group]</sub>

Danish Agency for Science, Technology and Innovation  
2010

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### Indledning

Denne rapport fremlægger resultaterne af en evaluering af dansk deltagelse i EU's 6. og 7. rammeprogram for forskning og teknologisk udvikling (FP6 og FP7), som Technopolis Group har gennemført på vegne af Forsknings- og Innovationsstyrelsen.

Evalueringens overordnede formål har været:

- at vurdere de økonomiske, videnskabelige og erhvervsmæssige **fordele** ved dansk deltagelse i rammeprogrammerne samt at vurdere dansk deltagelse i forhold til situationen i andre lande.
- at identificere de **strategier**, der anvendes i forhold til deltagelsen i et rammeprogram, inklusive de strategier der anvendes for at påvirke rammeprogrammernes prioriteter og hensigter, udvikling af partnerskaber og alliancer, maksimering af succesrater i ansøgningsprocessen samt opnåelse af det størst mulige udbytte af deltagelse.

Evalueringen omfatter dansk deltagelse i FP6 og FP7 med en dybdegående vurdering af de fordele ved dansk deltagelse, som er opnået, samt af strategier for deltagelse inden for tre udvalgte fokusområder, nemlig sundhed, fødevarer og nanoteknologi.

Evalueringen baserer sig på en registerbaseret analyse af dansk deltagelse i FP6 og FP7, en spørgeskemaundersøgelse blandt 1.100 danske deltagere i de to programmer (32 procent besvarede spørgsmålene) og 40 semistrukturerede interviews med universiteter, medlemmer af referencegrupper, nøgledeltagere fra de tre fokusområder samt repræsentanter for udvalgte, forskningsaktive virksomheder, der ikke har deltaget i FP6 og FP7. Da FP7 endnu ikke er afsluttet, vil resultaterne for Danmark og andre landes deltagelse ændre sig, efterhånden som nye FP7-opslag bliver udsendt, og yderligere data bliver tilgængelige.

### Dansk deltagelse i FP6 og FP7 frem til i dag

Evalueringen viser, at Danmark i høj grad har deltaget i FP6 og i FP7 frem til i dag. Danmark har opnået EU-finansiering på henholdsvis 39 procent og 25 procent mere end bidragsandelen til EU-budgettet i FP6 og FP7. Danmarks økonomiske udbytte er også langt over gennemsnittet i forhold til landets relative befolkningsstørrelse og en anelse over gennemsnittet i forhold til bruttoudgifter til forskning og udvikling (GERD).

Evalueringen viser også, at Danmarks deltagelse i EU's rammeprogrammer og niveauet for EU-finansiering tidligere har været højere. Derudover viser evalueringen, at der er en tydelig nedadgående tendens med hensyn til deltagelse i successive rammeprogrammer. Tilbagegangen skyldes til en vis grad udvidelsen af EU, men tilbagegangen er større i eksempelvis Sverige, Finland, Norge og Nederlandene.

Danmark deltog i alle 17 tematiske prioritetsområder i FP6. Dansk deltagelse var størst inden for områderne *life science*, *fødevarer*, *fødevarer og -sikkerhed*, *bæredygtig udvikling*, *videnskab og samfund*, *programstøtte* og *støtte til koordination af aktiviteter (ERA-net)*. Danmark har endnu ikke deltaget i alle FP7's 22 tematiske prioritetsområder, men deltagelsesmønsteret i FP7 ligner det i FP6. Dansk deltagelse er indtil videre størst inden for prioritetsområderne *fødevarer*, *sundhed*, *miljø* og *energi* i FP7. Resultaterne tyder på, at Danmark opnår de stærkeste resultater inden for områder, hvor styrken af de industrielle sektorer og dansk forskning er velkendt. Derudover har dansk deltagelse inden for prioritetsområdet *nanoteknologi* udviklet sig markant fra FP6 til FP7, hvilket tyder på en styrket indsats på dette område.

Endelig viser evalueringen, at danske succesrater for ansøgninger til FP6 var over gennemsnittet for rammeprogrammet som helhed (23 procent for ansøgninger med dansk deltagelse sammenlignet

med 18 procent for alle ansøgninger). Derudover lå succesraterne for danske ansøgninger også over gennemsnittet i FP6 inden for 14 af de i alt 17 tematiske prioritetsområder, i særlig grad inden for områderne *life sciences, fødevarer, kvalitet og -sikkerhed, bæredygtig udvikling, videnskab og samfund, Euratom, internationalt samarbejde, programstøtte og koordination af aktiviteter (ERA-net)*. Danske succesrater lå også over gennemsnittet i forhold til hovedparten af de virkemidler, som blev benyttet til at implementere FP6's aktiviteter. Data stillet til rådighed af EuroCenter bekræfter, at succesraterne for danske ansøgninger til FP7 indtil videre også har været meget højere end gennemsnittet for FP7 som helhed. På baggrund af disse data kan det konkluderes, at danske succesrater i forhold til rammeprogrammerne er høje inden for de fleste af programmets prioritetsområder.

### Strategier som højner rammeprogrammernes relevans

Evalueringen viser, at deltagelse i både FP6 og FP7 har haft stor betydning for de involverede aktører, og den afdækker en bred vifte af strategier og tiltag, der er implementeret i Danmark for at påvirke og øge relevansen af arbejdsprogrammer i rammeprogrammerne og for at opfordre til dansk deltagelse fremadrettet. De vigtigste tiltag er tilvejebringelse af bidrag til nationale repræsentanter i programkomiteerne; oprettelse af referencegrupper (der skal styrke nationale drøftelser af udkast til arbejdsprogrammer og rådgive om dansk involvering) inden for syv af prioritetsområderne i FP7; deltagelse i konferencer, workshops og netværksaktiviteter på EU-niveau; deltagelse i Europæiske Teknologiplatforme, Fælles Teknologiiinitiativer, Artikel 169-aktiviteter og andre fora, som kan påvirke kursen for fremtidige forskningsmæssige rammer og prioriteringer; deltagelse i rammeprogrammernes rådgivningsgrupper samt lobbyvirksomhed med henblik på at påvirke planlægningen af rammeprogrammerne.

Danske aktører anvender i større eller mindre grad alle de tilgængelige mekanismer, som evalueringen har identificeret kan drages i anvendelse for at få indflydelse på rammeprogrammerne. Evalueringen viser dog, at det i forskerkredse vurderes, at Danmark har udviklingspotentialer i forhold til især lobbyvirksomhed, og at deltagerens fremgangsmåde kan styrkes, når det drejer sig om at påvirke programmerne. Evalueringen anbefaler på den baggrund at:

- Ministeriet bør styrke referencegruppe-modellen ved (i) at udvide dækningen til andre eller alle tematiske prioritetsområder/programkomiteer, (ii) i højere grad at tydeliggøre over for forskerne at der er mulighed for at påvirke arbejdsforslag for programmerne og (iii) at offentliggøre den danske holdning som ministeriet fremlægger på møder i programkomiteerne.
- Ministeriet bør i fællesskab med andre medlemslande udvikle en strategi for dansk involvering i større fora med henblik på at styrke graden af indflydelse på rammeprogrammerne. Derudover bør ministeriet indsamle og afrapportere data om niveauet for dansk deltagelse. Strategierne for påvirkning af programmerne bør inkludere fremgangsmåder, hvorpå man i fællesskab med andre medlemslande kan øge graden af indflydelse.
- Ministeriet bør undersøge, hvordan koordinering af forskningsstrategier, planlægning og fremskaffelse af støtte midler kan forbedres på tværs af sektorer og traditionelle videnskabelige hovedområder i tråd med udviklingen på EU-niveau.

### Strategier for øget efterspørgsel efter deltagelse i rammeprogrammer

Kombinationen af høje succesrater og faldende deltagelse i rammeprogrammerne viser, at den danske efterspørgsel efter deltagelse i rammeprogrammerne er faldende, og at efterspørgslen med hensyn til FP6 og FP7 er under de niveauer, som ville kunne opnås - og som er blevet opnået

tidligere. Desuden har de høje succesrater inden for de fleste prioritetsområder i FP6 og FP7 været den primære årsag til de opnåede niveauer snarere end graden af efterspørgsel. Der er derfor potentiale for at øge efterspørgslen inden for næsten alle rammeprogrammernes prioritetsområder.

Der er flere årsager til den faldende efterspørgsel. Tendensen kan forklares af faktorer, som svækker eller hæmmer danske forskeres tendens til at søge rammeprogrammerne, herunder det høje niveau af offentlige forskningsmidler i Danmark i løbet af de sidste ti år; antagelser om meget lave succesrater i forbindelse med ansøgninger om støtte fra rammeprogrammerne; detaljeringsgraden i rammeprogrammernes opslag som lægger betydelige begrænsninger for, hvilken type forskning der kan udføres; den meget store administrative byrde, som er forbundet med deltagelse i rammeprogrammerne især for ledere af forskningsprojekter (koordinatorer); lav prioritering af deltagelse i rammeprogrammerne i Danmark indtil for relativt nylig samt dårligt udviklede støttesystemer for rammeprogramdeltagelse.

Problemet med faldende deltagelse i rammeprogrammerne er erkendt af Ministeriet for Viden, Teknologi og Udvikling samt af de enkelte institutioner. Derfor er der i de seneste år udviklet en lang række strategier og tiltag i et forsøg på at stoppe og vende tilbagegangen. Disse indbefatter meget tydelige signaler fra ministeriet om at prioritere deltagelse i ramme-programmet; nedsættelse af referencegrupper som virkemidler til at styrke dansk påvirkning af rammeprogrammerne; styrkelse af EuroCenter som nu er integreret i ministeriet og opnormeret personalemæssigt, og som tilbyder mere omfattende støtteforanstaltninger. Derudover indbefatter strategier og tiltag økonomiske incitamenter for universiteterne i form af midler givet på baggrund af niveauet af finansiering fra rammeprogrammerne; omfattende økonomisk støtte til universitetsforskere og små og mellemstore virksomheders deltagelse; styrkede centrale støttekontorer på danske universiteter; og endelig øget anerkendelse af og

belønning for deltagelse i rammeprogrammerne inden for universitetssystemet, især for projektkoordinatorer og modtagere af bevillinger fra Det Europæiske Forskningsråd (ERC).

I forbindelse med evalueringen er der modtaget overvældende positive tilbagemeldinger angående omfang og kvalitet af den støtte, som EuroCenter og universiteternes centrale støttekontorer tilbyder. Den erfaring, viden og imødekommenhed, som støtteformidlerne lægger for dagen, er af høj kvalitet, og det lader til, at støtten både er effektiv, fremmer høje deltagelsesniveauer og succesrater i rammeprogrammerne samt medvirker til at sikre, at forskningsprojekter, som er koordineret af danske forskere, forløber så gnidningsfrit som muligt. Ligeledes er der modtaget meget positive tilbagemeldinger angående ministeriets tiltag for at promovere, belønne og støtte deltagelse i rammeprogrammerne. Selv om de støtteforanstaltninger, som skal støtte dansk deltagelse i rammeprogrammerne, er omfattende og af god kvalitet, identificerer evalueringen også et antal områder, hvor foranstaltningerne kan styrkes yderligere. På den baggrund anbefaler evalueringen at:

- EuroCenter og de større forskningsinstitutioner bør fordoble deres indsats for at promovere fordele ved deltagelse i rammeprogrammerne og omfanget af støttemuligheder og hjælp både nationalt og på institutionelt niveau.
- Der bør tages initiativ til (i) at integrere deltagelse i rammeprogrammerne som et væsentligt 'succeskriterium', når man vurderer ansøgninger om offentlige forskningsmidler, (ii) at strategisk tilknytning og komplementaritet mellem nationale forskningsprogrammer og rammeprogrammerne forbedres, (iii) at præmieringspuljen bevares, (iv) at det sikres, at forskere kan få dækket de 25 procent af udgifterne til forskningsprojekter i rammeprogrammerne, som ikke er dækket af EU-finansieringen, og (v) at alle forskningsråd anerkender og formidler aktiv støtte for deltagelse i rammeprogrammerne.

- Ministeriet bør undersøge, hvordan man kan give større anerkendelse og belønning til forskere, som danner partnerskab med danske virksomheder som del af deres forskningsprojekter i rammeprogrammerne, og forbedre den økonomiske og praktiske støtte til SMV'er.
- Der bør gøres yderligere anstrengelser for at udbrede 'best practice' for støttetildeling fra rammeprogrammerne på tværs af universitetssektoren, og der bør gennemføres en undersøgelse af de mest effektive universiteters praksis og gode løsninger med henblik på udbredelse heraf.
- Ministeriet bør i samarbejde med andre lande drive lobbyvirksomhed i Kommissionen for at opnå en grundlæggende forenkling af de økonomiske, administrative og rapporteringsmæssige procedurer forud for det 8. rammeprogram.
- Der bør tages initiativ til yderligere kortlægning af dansk forsknings styrkepositioner, både for så vidt angår den offentlige og især den private sektor (f.eks. SMV'er), med det formål at forbedre forståelse for de områder, hvor dansk deltagelse i rammeprogrammerne kan styrkes. Samtidig bør støtten til indgåelse af partnerskaber både i Danmark og i EU forbedres, ligesom formidlingen af dansk forskningskapacitet bør styrkes.

### Strategier for at forøge chancen for succes i ansøgninger til rammeprogrammet

EuroCenter og universiteternes centrale støttekontorer tilbyder et omfattende udbud af støtteforanstaltninger til ansøgernes forberedende faser og hjælper med at sikre ansøgerne maksimale chancer for at opnå succes med deres ansøgninger. Disse foranstaltninger inkluderer rådgivning i forbindelse med ideer til forskningsansøgninger (screening), vurdering og kommentering af ansøgningsudkast, støtte til udarbejdelse af ansøgningsudkast vedrørende ledelse, administrative og økonomiske forhold i ansøgningerne og formalitetstjek. Nogle støtteenheder har udviklet skabeloner og rådgivning for at hjælpe forskere med at udarbejde gode ansøgninger, og andre

støtteenheder tilbyder sparring på baggrund af tidligere ansøgninger, der har udløst bevillinger. Støtteenhederne rådgiver også ansøgere om hyppige årsager til afslag gennem løbende monitorering af ansøgninger, der enten har fået afslag eller udløst bevilling som led i deres egen kapacitetsopbygning.

Antallet af ansøgere, der gør brug af tilbuddet om støtte til ansøgningsudformning, forekommer ret lavt, og mange centrale støttekontorer påpeger, at de må gøre sig anstrengelser for at motivere ansøgere til at gøre brug af tilbuddet om støtte. På trods af disse anstrengelser foretrækker mange ansøgere at udarbejde deres ansøgninger selv, og de indsender ansøgninger uden brug af den støtte, enhederne tilbyder. Evalueringen viser, at mange universiteter udelukkende har en decentraliseret tilgang til ansøgningsprocessen og ikke pålægger deres forskere at orientere det centrale niveau om deres intention om at indsende ansøgninger om forskningsmidler fra rammeprogrammerne. På den baggrund anbefaler evalueringen at:

- Alle danske universiteter bør pålægge deres forskere at oplyse det centrale niveau, når de planlægger at indsende ansøgninger om forskningsmidler til rammeprogrammerne. På den baggrund kan støtteenhederne fremadrettet sørge for mere effektiv støtte og bedre koordinere den samlede tilgang til deltagelse i rammeprogrammerne generelt.

### Strategier til at forstærke projektimplementeringen i rammeprogrammerne

De eneste alvorlige problemer, som evalueringen identificerer, er de store administrative og rapporteringsmæssige byrder, som følger med bevillinger fra rammeprogrammerne, og som især gør sig gældende for projektkoordinatorer. Universiteternes støttekontorer letter denne byrde, og mange støttekontorer påtager sig administrativ og økonomisk projektstyring. Dette tiltag har tydeligvis forbedret forskernes oplevelse af rammeprogrammerne, og det har bidraget til at overvinde nogle barrierer for deltagelse. Professionalisering

og udlicitering af administrativ og økonomisk projektstyring er i tråd med udviklingen i andre lande, og det lader til, at universiteterne gør et godt stykke arbejde og udvikler deres kompetencer på dette område, hvilket understøtter forskernes fokus på forskningen. Indtil Kommissionen effektiviserer og forenkler kravene forbundet med forskningsbevillinger fra rammeprogrammerne, er det sandsynligt, at der fortsat vil være et behov for disse støtteforanstaltninger.

Der er imidlertid også et potentielt problem, for så vidt angår den støtte, der er tilgængelig for SMV'er i løbet af projekterne. Det lader ikke til, at SMV'er har adgang til den samme grad af støtte som universiteterne, og det er uvist, om EuroCenter er i stand til at give den støtte til SMV'er, som universiteterne kan give deres forskere. Eftersom evalueringen viser, at danske virksomheder synes at spille en mindre rolle i forskningsprojekter under rammeprogrammerne, anbefales det at:

- EuroCenter bør undersøge mulighederne for at styrke virksomheders rolle i forskningsprojekter under rammeprogrammet og sørge for at tilbyde enhver form for støtte, der er behov for.

### Opnåede fordele gennem deltagelse i rammeprogrammet

De fleste målsætninger for og de fleste resultater af deltagelse i rammeprogrammerne er forskningsprodukter (udgivelser, konferencer, uddannet personale etc.), og der er langt mindre aktivitet, for så vidt angår innovative produkter (f.eks. nye produkter, patenter, licenser osv.). Dette er forventeligt, eftersom den forskning, der udføres inden for rammeprogrammerne, er af prækommerciel beskaffenhed. Men evalueringen viser også, at forskningsprojekter under rammeprogrammerne i mindre grad end forventeligt ser ud til at skabe innovative resultater, også blandt de deltagere der fremhæver denne type resultater som ønskelige.

En sammenligning af deltagernes motiver og mål på den ene side og de opnåede fordele på den anden side viser, at forskningsprojekter under rammeprogrammet har en tendens til at tilvejebringe de effekter, deltagere søger. De mest positive effekter, som er opnået, inkluderer etablering af nye relationer og netværk, øget forståelse og viden, øget videnskabelig og teknologisk kunnen samt forbedret ry og image. Størstedelen af deltagere angiver middelstor effekt på disse områder.

De opnåede fordele relaterer sig som forventeligt til begrebet 'samarbejde', og deltagere bekræfter, at deltagelse i rammeprogrammet primært handler om udveksling af viden og adgang til komplementære muligheder, redskaber, metoder osv. En af de mest markante effekter af rammeprogrammerne har været at øge samarbejdsniveauet og netværksdannelsen mellem forskere og teknologer på EU-niveau. Evalueringen vurderer, at danske deltagere i løbet af FP6 blev eksponeret for omkring 10.000 nye partnere, hvoraf omkring halvdelen må forventes at bestå i fremtiden.

Netværksdannelse og partnerskaber på tilsvarende niveau ville ikke have været muligt uden rammeprogrammerne.

Mere end to tredjedele (68 procent) af de danske deltagere i FP6 og FP7 finder, at de har opnået en positiv nytteomkostningsgrad af deres projekter. Resten er delt i dem, som finder omkostninger og fordele ligeligt fordelt, og dem, som finder, at omkostningerne ved at deltage var større end fordelene. De deltagere, som anfører **negativ** nytteomkostningsgrad, peger på problemer forbundet med det høje administrationsniveau samt graden af bureaukrati, begrænset grad af støtte, vanskeligheder med at opnå medfinansiering samt mislykkede forsøg på at opnå projekternes videnskabelige målsætninger. De deltagere, som anfører **positiv** nytteomkostningsgrad, peger på betydelige fordele udsprunget af samarbejde i kraft af ny viden og nye kompetencer, stærkere profilering samt udvidelse af partnerskaber.

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Executive Summary



## Introduction

This report sets out the results of an evaluation of Danish participation in the Sixth and Seventh Framework Programme. Technopolis Group has carried out the study on behalf of the Danish Agency for Science, Technology and Innovation (Forsknings- og Innovationsstyrelsen).

The overall aims of the study were to:

- Assess the financial, scientific and commercial **benefits** of Danish participation in the Framework Programmes (FPs), and how this compares to the situation in other countries
- Identify the **strategies** employed in relation to Framework Programme (FP) participation, including strategies for influencing the FP priorities and calls, the development of partnerships and alliances, maximising chances of success within the application process, and deriving the maximum value from participation in terms of the benefits realised.

The scope of the study was Danish participation in FP6 and FP7, with more in-depth assessment of the benefits realised and the strategies for participation in three selected focus areas – Health, Food and Nanotechnology.

The methods employed in carrying out the study included a register-based analysis of Danish involvement in FP6 and FP7 (to date), a questionnaire survey directed to ~1,100 Danish participants in the two programmes (32 per cent response rate), and a series of 40 semi-structured interviews with university central support offices, reference group members and key participants from the three focus areas, and selected research active businesses that have not participated in FP6 or FP7. Because FP7 is still ongoing, the participation figures relating to Denmark's and other countries' performance in this FP are subject to ongoing change, as further FP7 calls are issued and further data becomes available.

## Danish participation in FP6 and FP7 (to date)

The results of the study have shown that Denmark achieved a good level of involvement in FP6, and

has had a good level of involvement in FP7 to date, achieving EC funding at levels 39 per cent and 25 per cent above its share of contribution to the EU budget for FP6 and FP7 respectively. Denmark's financial returns from FP6 and FP7 can also be seen to be significantly 'above average' in relation to the (comparative) size of its population, and very slightly above average in relation to its comparative level of Gross Expenditure on Research and Development (GERD).

While Danish involvement in FP6 and FP7 to date has been relatively strong on most measures, the participation data show that Denmark's share of participations and funding has previously been at higher levels, and that there is a clear downward trend in its share of participations across successive FPs. Some element of this decline can be attributed to European enlargement, but the data show that the fall in Denmark's FP participation and funding is larger than has been the case in comparator countries such as Sweden, Finland, Norway and the Netherlands.

Denmark participated in all 17 thematic Priority Areas of FP6. In relative terms, Danish involvement was highest in the *Life sciences, Food quality and safety, Sustainable development, Science & society, Policy support* and *Support for coordination of activities areas*. At the time of writing, Denmark had not yet participated in all 22 of the Priority Areas under which FP7 is organised, but a similar pattern of participation can be seen. In relative terms, Danish participation has been strongest in the Food, Health, Environment and Energy Priority Areas of FP7. These results indicate that Denmark is performing strongly in the areas where we would expect it to be, based on its major industrial sectors and the known strengths of its research base. Danish performance in the Nanotechnologies Priority Area appears to have improved significantly from FP6 to FP7, indicating a strengthening of performance in this important field.

An analysis of Danish success rates when applying to FP6 shows very clearly that these were well above average for the competition as a whole

(23 per cent for proposals with Danish participation as compared to 18 per cent for all proposals). Danish proposal success rates were also found to be above the FP6 averages in 14 of the 17 FP6 Priority Areas, and were particularly high in *Food quality and safety, Sustainable development, Science & society, Euratom, International cooperation, Policy support, and Coordination of activities areas*. Danish success rates were also above average in relation to most of the Instruments used to implement the FP6 priorities. Data supplied by the EuroCenter has confirmed that Danish proposal success rates in FP7 (to date) have also been much higher than the average for FP7 as a whole. Based on these data we can conclude that Danish success rates when applying to the FPs are very good, overall and across most areas of the programme.

### Strategies for increasing the relevance of the FPs

The results of this study have shown that both FP6 and FP7 were of high relevance to the participating communities. Our investigations have identified a wide range of strategies and actions that are now in place in Denmark and that are aimed at increasing the relevance of FP work programmes and calls to Danish participants. The principal mechanisms include provision of inputs to national representatives on the FP programme committees; the establishment of Reference Groups in seven FP7 priority areas to strengthen national consultation on draft work programmes and to advise on ways to enhance Danish involvement; participation in EU-level conferences, workshops and other network activities; participation in European Technology Platforms, Joint Technology Initiatives, Article 169 actions and other forums that are helping to set future FP research trajectories and priorities; participation on FP Advisory Groups; and range of ‘lobbying’ activities aimed at influencing Commission officials responsible for FP planning.

The various strategies employed to influence the FPs constitute a comprehensive body of actions, and we have not identified any ‘influencing’ mechanisms that are known to be available but

which are not currently being used at least to some extent by Danish actors. However, there is a collective sense within the research community that Denmark is not particularly strong at ‘lobbying’ and that there is potential to strengthen its approaches towards influencing the programmes. We have therefore made the following recommendations:

- The Ministry should strengthen the Reference Group mechanism by (i) extending its coverage to other (possibly all) priority areas / programme committees, (ii) raising awareness among the research community as to the routes through which they can provide inputs to the draft work programmes, and (iii) publishing the final positions adopted by the Ministry and taken forward to programme committee meetings
- The Ministry should develop a strategy for national involvement in the major forums that can be used to influence the FPs, and collect and report data on Danish participation levels. The strategy for influencing the programmes should include mechanisms to join forces with other Member States in order to strengthen negotiations and increase the level of influence that can be attained
- The Ministry should investigate ways to improve cross-coordination of research strategies, planning and funding across sectoral and disciplinary boundaries, in line with developments at EU-level.

### Strategies for increasing demand for FP participation

A combination of high success rates and falling levels of participation in the FPs can only lead to one conclusion – that levels of demand for FP participation within Denmark have been declining and, within FP6 and the early stages of FP7, were below the levels that could be achieved and that have been achieved in the past. Moreover, in most FP6 and FP7 Priority Areas high success rates rather than high levels of demand have been the major contributory factor to the levels of performance achieved. There is scope therefore to increase levels of demand in almost all areas of the programmes.

There are a number of reasons underlying the downward trend in demand, which can be expressed in terms of factors that either depress or inhibit the tendency of Danish researchers to apply to the FPs. These include the high levels of national research funding in Denmark over the past decade; the perception that success rates when applying for FP funding are very low; the specificity of the FP calls, which place significant restrictions on the nature of the research that can be carried out; the very high management and administrative burden associated with FP participation, particularly for research project leaders (coordinators); a lack of prioritisation of FP participation within Denmark up until relatively recently; and under-developed support systems to assist participants in relation to the FPs.

The problem of declining participation in the FPs has been recognised by the Ministry of Science, Technology and Innovation and by individual institutions, and a wide range of strategies have been developed in recent years to try to halt and reverse the decline. These include very strong signals from the Ministry that FP participation should be prioritised; the creation of the Reference Group mechanism to strengthen Danish inputs into and influence over the FP work programmes; strengthening of the Danish EuroCenter, now internalised within the Ministry with more staff and a more comprehensive package of support on offer; direct financial incentives to the universities based on the level of FP funding achieved, and a fairly comprehensive body of financial grants to support participation by university researchers and Small and Medium-sized Enterprises (SME); strengthened central support offices in the Danish universities; and improved recognition and reward for FP participation within the university system, particularly for project coordinators and European Research Council (ERC) grant holders.

We received overwhelmingly positive feedback from users in relation to the range and quality of the support now on offer from the EuroCenter and university Central Support Offices (CSOs). The experience, knowledge and responsiveness of

the individual support providers are clearly very good and it is felt that the support is effective, helping to encourage higher levels of participation and success within the competition, and helping to ensure that projects coordinated by Danish researchers run as smoothly as possible. We also received very positive feedback on the steps taken by the Ministry to promote, reward and support FP participation. While the measures now in place to support Danish participation in the FPs are both comprehensive and of a good quality, we did identify a number of areas where the support provision could be further strengthened, and have therefore made the following recommendations:

- The EuroCenter and the major research performing institutions should redouble their efforts to promote both the benefits of FP participation and the full range of support and assistance that is now available nationally and at institutional level
- Steps should be taken to (i) integrate FP participation as a significant ‘success criterion’ when assessing national funding proposals, (ii) improve the strategic alignment and complementarity between national research programmes and the FPs, (iii) commit to retain the REWARD fund, (iv) ensure that researchers have routes to obtain the 25 per cent of FP project costs not covered by European Commission (EC) funding, and (v) ensure that all Research Councils recognise and provide active support for FP participation
- The Ministry should investigate ways to provide increased recognition and reward to researchers that partner with Danish companies within their FP projects, and improve the package of financial and practical support available to SMEs
- Further efforts should be made to share ‘best practice’ in FP support provision across the university sector, and a more in-depth review should be undertaken to identify and share effective practices and solutions in place within some universities and not others
- The Ministry, in conjunction with other countries, should lobby the Commission for a radical simplification of financial, administrative and reporting procedures ahead of FP8

- Efforts should be made to develop a stronger mapping of Danish research strengths in both the public and (particularly) in the private spheres (e.g. for SMEs), in order to improve understanding of areas where Danish FP participation can be strengthened, improve partner-matching services, both within Denmark and across the EU, and strengthen the promotion of Danish research capabilities.

### Strategies for increasing FP proposal success rates

The EuroCenter and university CSOs offer a comprehensive range of services to FP applicants to assist in the proposal preparation process and to ensure that applicants maximise their chances of success. These include advice on ideas for research proposals (screening); reviewing and commenting on draft proposals; dedicated assistance with drafting the management, administrative and financial elements of the proposals; and compliance checking. Some FP support units have developed templates and associated guidance to help researchers to develop strong proposals and some offer training sessions, using examples of successful proposals to coach applicants on what to do. The support units also help to advise on typical reasons for failure, reviewing successful and unsuccessful proposals in order to develop their own understanding.

The level of take-up of support services for proposal development appears to be relatively low, and many of the CSOs indicated that they have to push hard to encourage applicants to use their services. Despite these efforts, many applicants elect to 'go it alone' and proceed to submit proposals without recourse to the assistance available from the FP support units. We have also noted that many of the universities have a very decentralised approach, with most placing no requirement on researchers to notify centrally their intention to submit proposals to the FPs. We have therefore made the following recommendation:

- All Danish universities should require their researchers to notify their intention to submit FP proposals, so that the CSOs can provide more effective support and improve the coordination of approaches to FP participation.

### Strategies for enhancing FP project implementation

The only major issues we identified in relation to the execution of FP projects concerned the very high administrative and reporting burden that falls particularly on project coordinators. The university CSOs are now providing a range of support designed to alleviate the administrative burden, and many are taking on the role of administrative and financial project management on behalf of the project leaders. This is clearly helping to improve the experience of FP participation among researchers and to overcome some of the barriers to participation. The trend towards professionalisation and 'outsourcing' of administrative and financial project management is in line with developments in other countries, and the universities appear to be doing a good job in this respect, expanding their competencies in this area and helping to free the researchers up to focus on the research. Until such time as the Commission is able to significantly streamline and simplify its requirements it is likely that there will be a continued need for the CSOs to provide this kind of service.

There is, however, a potential issue with regard to the level of support available for SMEs during the projects. It is not clear that SMEs enjoy the same level of support as their university counterparts, and it is not clear that the EuroCenter is able to provide the same level of support to SMEs as can be assigned by the universities to their own researchers. Danish companies have been found to occupy fairly minor roles in their FP projects, and we have therefore made the following recommendation:

- The EuroCenter should investigate ways in which to strengthen Danish companies' roles in their FP projects, and should seek to provide whatever support is needed to enable them to do this.

### Benefits realised through FP participation

Most of the outputs sought and produced through FP projects are research outputs (publications, conferences, trained personnel, etc.) and there is far less activity in relation to the production of 'innovation' outputs (such as new products, patents, licenses and so on). This is to be expected given the pre-competitive nature of the research carried out within the FPs, but we have noted that FP projects tend to deliver these at a level below expectations, even where they are cited as desirable by participants.

A comparison of the motives and goals of the participants with the benefits realised indicates that FP projects do tend to deliver the kinds of impacts that the participants are seeking. The main positive benefits realised include new relationships and networks, increased understanding and knowledge, increased scientific and technological capabilities, and enhanced reputation and image. The vast majority of participants report medium-high impacts in each of these areas.

The benefits derived naturally revolve around the concept of 'collaboration' and participants confirm that FP participation is predominantly about exchange of knowledge and access to complementary capabilities, tools, methods, and so on. One of the major impacts of the FPs has been to increase the level of collaboration and networking between scientists and technologists at an EU level, and based on our analyses we have estimated that during FP6 Danish participants were exposed to some 10,000 new partners, almost half of which are expected to endure in the future. This level of networking and partnership formation simply could not be achieved in the absence of the Framework Programmes.

More than two-thirds (68 per cent) of Danish FP6/7 participants have realised a positive benefit to cost ratio from their FP projects, with the remainder split between those who stated that the costs and benefits were evenly balanced, and those who stated that the costs of participation had outweighed the benefits. Those reporting a **negative** benefit to cost ratio pointed to problems associated with the high levels of administration and bureaucracy involved, the limited amount of funding received, difficulties in securing co-funding to support their participation, and failure to achieve the scientific objectives of the projects. Many of our recommendations address these problems, although it is not possible to control for the failure of some projects to realise their scientific objectives. Those reporting a **positive** benefit to cost ratio pointed to the significant benefits realised from the collaboration in terms of new knowledge and competencies, increased profile, and extension of collaborative partnerships.

1. Introduction



This is the final report for the Evaluation of the benefits and strategies for Danish participation in the 6<sup>th</sup> and 7<sup>th</sup> Framework Programmes (FPs), which is being carried out by Technopolis Ltd on behalf of the Danish Agency for Science, Technology and Innovation (DASTI)<sup>1</sup>.

The overall aims of the study were to:

- Assess the financial, scientific and commercial **benefits** of Danish participation in the FPs, and how this compares to the situation in other countries
- Identify the **strategies** employed in relation to FP participation, including strategies for influencing the FP priorities and calls, the development of partnerships and alliances, maximising chances of success within the application process, and deriving the maximum value from participation in terms of the benefits realised.

The scope of the study was Danish participation in FP6 and FP7, with more in-depth assessment of the benefits realised and the strategies for participation in three selected thematic areas – Health, Food and Nanotechnology.

The methods employed in carrying out the study included a register-based analysis of Danish involvement in FP6 and FP7 to date, a questionnaire survey directed to Danish participants in the two programmes, and a series of semi-structured interviews. Additional analysis of both the participation data and questionnaire results has been undertaken for the three selected thematic areas, while most of the interviewees were also drawn from these three focus areas.

The report is organised into four further sections as follows:

- **Section 2** describes the methodology employed in carrying out the evaluation. (It begins by outlining the Terms of Reference for the study and then sets out the methods used to carry out the evaluation).

- **Section 3** presents the main findings from an analysis of Denmark's participation in FP6 and FP7 based on data supplied by DASTI and taken from the European Commission's E-CORDA database. The analyses provide a factual account of Denmark's level of involvement in the FPs and explore trends and changing patterns of participation at the level of main groups of actors, FP Priority Areas, and FP Instruments
- **Section 4** presents the principal findings from consultations with selected representatives of the Danish research and industrial communities. The information has been gathered through a questionnaire survey targeted to all Danish participants in FP6 and FP7 and through a series of interviews with university central support offices, reference group members, key participants and selected research active business that have not participated in FP6 or FP7
- **Section 5** presents our conclusions and recommendations.

A table of acronyms used in this report can be found at the end of the document (Figure 23).

The full results of the analysis of Danish participation in FP6 and FP7 and a more detailed presentation of the results from our questionnaire survey of FP6 and FP7 participants have been compiled into a separate annex report that is available for download from [www.fi.dk](http://www.fi.dk).

2. Methodology



This section describes the methodology employed during the course of this evaluation. We begin by outlining the main points of the study Terms of Reference and Requirement Specification issued by the Danish Agency for Science, Technology and Innovation (DASTI), which set out the issues to be addressed by the study and the methodology to be followed. We then go on to describe the programme of work carried out by the study team and the methods employed.

## 2.1 Study Terms of Reference

### 2.1.1 Overall study objectives

The main purpose of the evaluation, as set out in the study Terms of Reference and Requirement Specification was to identify the benefits and strategies for Danish participation in the EU Framework Programmes (FPs), focusing on FP6 and FP7. The study was therefore designed to answer the following broad questions:

- What are the financial, scientific and commercial **benefits** of Danish participation in the FPs, and how does this compare to the situation in other countries?
- What are the **strategies** of participants in relation to FP participation, including strategies for influencing the FP priorities and calls, the development of partnerships and alliances, maximising chances of success within the application process, and deriving the maximum value from participation in terms of the financial, scientific commercial benefits realised?

The scope of the study was Danish participation in FP6 and FP7, with more in-depth assessment of the benefits realised and the strategies for participation in three selected thematic areas – Health, Food and Nanotechnology. The first two represent areas where Denmark’s rate of return are highest and they are also of central importance to the Danish research landscape and economy. The third area is a promising new field where there is potential for increased Danish participation in the

future. All three areas have been present in FP6 and FP7 and are expected to be included in FP8, so the findings in these areas should be applicable in the longer term.

The results of the evaluation are intended to contribute to the identification of operational goals for Denmark’s future participation in FP7/8, and to support a more nuanced basis for tracking the benefits of participation. The evaluation is also intended to provide an improved basis for political goal setting at national and institutional levels, and to enable both policy makers and prospective participants to improve their approaches towards FPs in the future.

### 2.1.2 Methodological requirements

The Terms of Reference and Requirement Specification also outlined the main methods to be used in carrying out the study. The following elements were required:

- **Register-based analysis** of data relating to Denmark’s and others’ participation in FP6 and FP7, as well as patterns of cooperation and comparative success rates
- **Desk research** involving the collection and analysis of existing literature, analyses and evaluations regarding Denmark’s participation in the FPs
- **Questionnaire surveys** of Danish participants in FP6 and FP7 to elicit a more detailed understanding of the scientific and commercial benefits of participation and on strategies employed in maximising participation levels and benefits gained
- **Interviews** with representatives of administrative support groups at universities, selected members of the national reference groups, Small and Medium-Sized Enterprises (SMEs) with repeated participation within the Health, Food and Nano areas, and non-participants
- **Final evaluation report** covering the purpose of the study, methods employed, results obtained, and conclusions and recommendations drawn from the analysis.

## 2.2 Methodological approach

The following sub-sections detail the methodological approaches that were followed in order to collect and analyse the data and information needed to meet the requirements and answer the questions set out above.

### 2.2.1 Analysis of Danish participation in FP6 and FP7

The study methodology was required to include a register-based analysis of Danish participation levels and patterns in FP6 and FP7. The analysis was to cover the numbers of participating organisations, participations and funding received in comparison with other countries across all Priority Areas and Instruments of the FPs, patterns of cooperation between Danish participants and those from other countries and assessment of comparative success rates.

**Participation data** - DASTI provided various data sets relating to Danish participation in FP6 and FP7 projects. These contained (i) lists of all Danish participations in FP6 and FP7 projects, (ii) lists of all participants in FP6 and FP7 projects, and (iii) lists of all FP6 and FP7 projects (including those with Danish involvement). The data was in most respects comprehensive and complete and Technopolis undertook a range of analyses to describe the nature and extent of Danish participation in FP6 and FP7. This analysis focused around the questions set out in the study terms of reference and, wherever possible, the results of the analysis of Danish participation were compared and contrasted with overall patterns of participation in FP6 and FP7 to date. Specific results relating to the three selected thematic areas for the study were also highlighted.

It should be noted that in many cases within the databases the same organisation was listed under various different names. As such it has not been possible to undertake a detailed analysis based on the number of Danish *organisations* participating in FP6 or FP7. In addition, the fields relating to organisation (or 'activity') type are missing from the FP7 participation database, and so it has not

been possible to analyse FP7 participation data by *organisation type*. Finally, it is also important to note that we are not yet mid-way through FP7 and so it has not been possible to conduct the same level of analysis in relation to Danish participation in FP7, as was the case for FP6.

**Proposal data** - DASTI also provided two spreadsheets relating to Danish participation in FP6 proposals. The first contained a list of all (7,329) Danish participations in FP6 proposals. A preliminary analysis of this information revealed that there were a number of duplicate records (n=583). These were removed from the dataset prior to analysis, leaving a revised total count of 6,746 Danish participations in proposals submitted to FP6. The second spreadsheet contained summary tables showing success rates for Danish participations in proposals to FP6 by Priority Area, Instrument and Activity Type. These success rates were recalculated based on the cleaning of the data mentioned above. The study team then carried out as much analysis as was possible within the limitations of the dataset provided. This focused around the questions set out in the study Terms of Reference.

**Latest FP7 data** - The EuroCenter maintains information on contracts awarded and success rates in FP7, including those with Danish involvement. Towards the end of this study DASTI provided the latest headline figures from the EuroCenter on contracts awarded and success rates in FP7, both overall and specifically for Denmark. The information covers contracts awarded under FP7 up to November 2009 and provides information on the overall number of FP7 projects, the total number of participations in these projects, plus total EU-funding, as well as success rates in each case. This latest information on Danish participation and success rates in FP7 has been included within the sections on participation and proposal success rates within this report.

The full analysis of Danish participation in FP6 and FP7 projects and proposals, and a more detailed explanation of the methodology employed is presented in the Appendix.

### 2.2.2 Desk research

The evaluators were required to collect, analyse and make use of existing literature, analyses and evaluations regarding Denmark's participation in the FPs, drawing on publications of the EC, other national FP evaluations, and information produced by Danish organisations.

The study team obtained copies of relevant published evaluations relating to FP6 and FP7, and DASTI identified further relevant documents produced by organisations in Denmark relating to participation in the FPs. These documents were examined to identify relevant information and data to support our analysis of Danish participation and our investigations into the benefits, rationales and strategies for participation.

### 2.2.3 Survey of Danish participants in FP6 and FP7

The study methodology was required to include a survey directed to all Danish participants in FP6 and FP7. It was agreed that these participants would only be asked to complete one copy of the questionnaire, answering on behalf of themselves or their organisations / research group, rather than in relation to a specific project.

Technopolis developed a preliminary draft of a questionnaire survey to be sent to all Danish participants in FP6 and FP7 projects, with the question set being designed to address the various information requirements contained in the study Terms of Reference, and focusing on elements that could not be answered through the analysis of participation data, or that would not be better addressed through the programme of interviews. In particular it was to be designed to elicit a more detailed understanding of the scientific and commercial benefits of participation and on the strategies employed in maximising participation levels and the benefits gained.

In parallel with the development of the questionnaire, Technopolis analysed and prepared the contact information relating to Danish participants in FP6 and FP7. The FP6 and FP7 databases

showed that Denmark had 2,040 participations in total across the two FPs. In most but not all cases (~1,700) the database included the name and email address of the Danish participant. Roughly 400 of these cases related to 'multiple' participations by the same person, so there were in fact 1,247 individuals (or 'participants') who could receive the survey request. In addition, there were also 69 cases where a participant's name was given in the databases, but not their email address. We were able to identify email addresses for 54 of these individuals, increasing the total number of participants targeted by the survey to 1,301.

Emails containing the final questionnaire were sent to the participants, with a request to participate in the survey. The deadline for completion of the questionnaire was set at 6<sup>th</sup> November 2009, giving respondents four full weeks in which to provide a response. A small number of 'undeliverable' messages were received as well as several 'out of office' messages. In addition, some of the targeted individuals were identified as having already 'opted out' of receiving questionnaires distributed through our on-line survey tool. Taking the undeliverable and 'opt out' messages together, we can estimate that our request failed to reach 190 people, leaving us with a pool of possible respondents numbering 1,111.

A total of 360 respondents provided a useable questionnaire return, giving an overall response rate of 32 per cent (from 1,111 possible respondents). There was a good level of response from each organisation type (Higher Education, Research Organisations, Industry and 'Other'), with at least 50 responses from each of the main categories. The distribution of responses was also broadly in line with the overall share of FP6 participations accounted for by each type.

The questionnaire data was analysed in order to determine the pattern of responses for each question. In a small number of cases separate analyses were carried out by certain sub-groups of respondents. Three main sub-groups have been used:

- Analyses by broad organisation type, splitting respondents into (i) Higher Education and Public Research Organisations (62 per cent of respondents), and (ii) Industry and Private Research Organisations (24 per cent of respondents)
- Analyses by involvement in FP6 and FP7, based on responses to a question about levels of involvement in FP6/7. Respondents were split into two broad groups covering (i) single participants (that have participated in only one FP6/7 project), and (ii) repeat participants (that have participated in more than on FP6/7 project)
- Analyses by the three selected thematic areas, splitting respondents into those participating in the Food, Health and Nanotechnology areas and those participating in other parts of the FPs.

The full analysis of the survey of Danish participants, and a more detailed explanation of the methodology employed are presented in the accompanying Appendix.

#### 2.2.4 Telephone and face-to-face interviews

The study methodology was required to include a programme of 40 telephone and face-to-face interviews with key Danish actors. Because the focus of the study was on the benefits realised and strategies adopted in relation to FP participation, in-depth interviews were intended to deepen our understanding in these areas, and provide a richer and more qualitative perspective than the one revealed through the survey.

Two interview guides were developed for (a) participants and support providers, and (b) non-participants. These were developed from the Terms of Reference for the study and were designed to help the study team to gain a more qualitative understanding of strategies and benefits. Interviews were semi-structured, beginning with a defined set of questions and ‘topics’ to discuss, but with a degree of flexibility as to exactly which questions would be tackled and in what depth.

As required, a total of 40 telephone and face-to-face interviews were undertaken with Danish actors, covering the following five main groups. Beyond the University Central Support Offices, most interviewees were drawn from within the three selected thematic areas – Food, Health and Nanotechnology.

- **Administrative Support Groups / Central Support Offices (ASGs/CSOs)** – Sixteen representatives of the ASGs/CSOs at seven Danish universities
- **Reference Group (RG) members** – Twelve selected RG members, including university and businesses contacts within the health, food and nanotechnology areas
- **Participants** – Six key industry participants from the FP6 and FP7 food, nanotechnology and health areas
- **Non-participants** – Four representatives from non-participating SMEs
- **EuroCenter** – Two representatives from the EuroCenter organisation

Hand written notes were taken during the interviews and written up immediately afterwards. All of the interview notes were then transferred into a single spreadsheet, with comments organised against broad question areas in order to aid analysis. The feedback was then reviewed and analysed in order to summarise the main points raised in relation to the strategies adopted and the benefits realised and to gauge the weight of opinion. The feedback gained through interviews has been used throughout the report to support the findings from other sources of data information.

A copy of the two interview guides developed and a full list of all individuals consulted via interview is provided in the accompanying Appendix.

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### **2.2.5 Analysis and reporting**

An interim report was produced in October 2009, two months after the kick-off meeting for the study. This report detailed the progress made up to that point on all of the main components of the workplan and presented preliminary results from the analysis of participation data. The interim report also provided information on progress with the administration of the questionnaire survey and the setting up and carrying out of interviews, as well as early findings from the questionnaire surveys.

Following completion of all data collection and analyses a final report was prepared. Conclusions and recommendations were developed, based on a full analysis of all of the data and feedback. Specific recommendations have been made in areas where the available evidence (and particularly the views of Danish participants) suggested that changes or improvements would be both feasible and beneficial.

Following comments from DASTI and some Danish Universities, the report was finalised. It includes the elements set out in the Requirement Specification, and adheres to the basic structure and length agreed with DASTI. It describes the scope and purpose of the evaluation, the methodology employed, and the main findings from our work. It also sets out our conclusions and recommendations and contains an Executive summary. Supporting information is included in a separate Appendix.

3. Analysis of Denmark's participation in FP6 and FP7



### 3.1 Introduction

This section of the report provides a factual analysis of Danish participation in the Sixth and Seventh Framework Programme.

A fairly full analysis of FP6 participation has been possible based on a complete data set covering not only Danish participations in project and funding allocations to Danish partners but also Danish participation in proposals submitted to FP6 and Danish success rates within the competition. Because FP7 is still underway, more limited data was available. Data on Danish participation in FP7 projects and funding received over the first couple of years of FP7 was available, although this did not allow us to provide an analysis of participation by type of organisation. However, due to the relatively small number of FP7 projects in which Denmark has participated, it has not been possible to provide meaningful breakdowns at the level of Priority Areas or Instruments for all areas of the analysis.

Towards the end of this study, DASTI provided the latest available headline figures from the Euro-Center on FP7, covering contracts awarded and success rates up to November 2009. This latest information is reported on separately in Sections 3.7 (participation) and 3.9.2 (success rates).

### 3.2 Danish participation in the Framework Programmes

#### 3.2.1 Danish involvement in FP projects

Figure 1 shows the total numbers of FP4, FP5, FP6 and FP7 projects with Danish involvement and compares these to the total number of projects supported under each Programme. Denmark's project involvement rate (per cent) for each FP is shown, as are the changes over time in terms of the total numbers of FP projects supported and the number in which Denmark has participated.

The data reveal that Denmark has participated in 4,600 projects across FP4-7 (to date) out of a total of just over 45,000 funded projects. Denmark's average project involvement rate has therefore been ~10.1 per cent, and has ranged from a low of 8.8 per cent (for FP7 to date) to a high of 11.1 per cent (for FP6).

These data, taken alone, do not reveal any clear trend – positive or negative – concerning Denmark's level of FP project involvement over time. However, they do signal that Denmark's involvement in FP7 projects, at least on current performance, may end up being lower than that of previous FPs.

Figure 1 – Denmark's involvement in FP4, FP5, FP6 and FP7 projects

Indicator	FP4	FP5	FP6	FP7 (to date)	Total
Number of projects with Danish involvement	1,589	1,577 (-1%)	1,123 (-29%)	311 (-72%)	4,600
Number of funded projects	15,457	16,251 (+5%)	10,091 (-38%)	3,551 (-65%)	45,350
Share of projects with Danish involvement	10.3%	9.7%	11.1%	8.8%	10.1%

Sources: 'The impact of EU Framework Programmes 4/5 in the UK' (Technopolis, July 2004), 'Figures on Danish participation in FP6' (Forsknings-og Innovationsstyrelsen, August 2008) and FP7 participation data (E-CORDA, September 2009)

### 3.2.2 Denmark's participation in FP projects

Figure 2 shows the total number of Danish participations in FP5, FP6 and FP7 projects (data for FP4 are not available) and compares these to the total number of *participations* (all countries) under each Programme. Denmark's share of all participations for each FP is shown, as are the changes over time in terms of the total numbers of FP participations and the number of Danish participations.

The data reveal that Denmark has had just over 4,200 participations across FP5, 6 and 7 (to date) out of a total of just over 180,000 participations (all countries). Denmark's share of all FP participations for these programmes has averaged 2.35 per cent, but has declined steadily from 2.60 per cent in FP5 to 1.86 per cent in FP7 (to date).

In order to determine the extent to which Denmark's falling participation levels is part of a wider trend we compared the Danish situation with that of four key comparator countries

(Sweden, Finland, Norway and the Netherlands). Figure 3 presents the results.

Denmark's decline in its share of participations, from 2.6 per cent in FP5 to 2.2 per cent in FP6 and then 1.9 per cent in FP7 represents a proportionate decline of 15 per cent and 16 per cent respectively. Norway has similarly experienced a decline in both periods, though to a lesser extent from FP5 to FP6. Two of the comparator countries (Finland and the Netherlands) saw a fall from FP5 to FP6, but then increased their share of participations in FP7. This change was particularly marked for Finland. Sweden is the only comparator country to have seen an increase (though slight) in its participation rates across both of the periods and to have a higher rate of participation in FP7 (to date) than was the case in FP5.

These comparisons show that while other countries may also have seen a decline in their share of FP participations from FP5-6 and from FP6-7 the fall in Danish participations appears to be more significant (i.e. greater) than has been the case for selected comparator countries.

Figure 2 – Denmark's participation numbers in FP4, FP5, FP6 and FP7 projects

Indicator	FP4	FP5	FP6	FP7 (to date)	Total
Number of Danish project participations	n/a	2,192	1,641 (-25%)	399 (-76%)	4,232
Number of project participations (all countries)	n/a	84,264	74,400 (-12%)	21,497 (-71%)	180,161
Danish share of all project participations	n/a	2.60%	2.21%	1.86%	2.35%

Sources: 'The impact of EU Framework Programmes 4/5 in the UK' (Technopolis, July 2004), 'Figures on Danish participation in FP6' (Forsknings-og Innovationsstyrelsen, August 2008) and FP7 participation data (E-CORDA, September 2009)

Figure 3 – Participation shares in FP5, FP6 and FP7 – Denmark and selected comparator countries

Country	Share of participations			% change in share	
	FP5	FP6	FP7	FP5 - FP6	FP6 - FP7
Denmark	2.6%	2.2%	1.9%	-15%	-16%
Sweden	3.5%	3.6%	3.6%	1%	1%
Finland	2.4%	1.9%	2.2%	-19%	14%
Norway	1.9%	1.7%	1.5%	-8%	-17%
Netherlands	6.0%	5.5%	5.6%	-9%	3%

Sources: 'The impact of EU Framework Programmes 4/5 in the UK' (Technopolis, July 2004), 'Figures on Danish participation in FP6' (Forsknings-og Innovationsstyrelsen, August 2008) and FP7 participation data (E-CORDA, September 2009)

**Figure 4 – Denmark’s EU funding allocations under FPs 4, 5, 6 and 7 (€ million)**

Indicator	FP4	FP5	FP6	FP7 (to date)	Total
Danish FP funding allocation	410	399 (-3%)	396 (-1%)	136 (-66%)	1,341
Total FP funding allocations (all countries)	13,215	14,960 (+13%)	16,669 (+11%)	6,652 (-60%)	51,496
Danish share of FP project funding	3.10%	2.67%	2.38%	2.05%	2.60%

Sources: FP4 and FP5 data - 'Figures on Danish participation in FP6' (Forsknings-og Innovationsstyrelsen, August 2008), FP6 and FP7 data – FP6/7 participation data (E-CORDA, September 2009)

### 3.2.3 FP funding realised by Danish participants

Figure 4 shows the volumes of EU FP funding allocated to Danish participants under FP4, 5, 6 and 7 (to date) and compares these to the total funding allocations made (i.e. to all countries) under each Programme. Denmark’s share of the total for each FP is shown, as are the changes over time in terms of the total volume of FP funding allocated, overall and to Danish participants.

The data reveal that Danish participants have received just over €1.34 billion across FP4-7 (to date) out of a total of just under €51.5 billion (all countries). Denmark’s share of FP funding has therefore averaged 2.60 per cent. However, as with participation numbers, the share of FP funding awarded to Danish participants has declined steadily from one FP to the next, from a high of 3.10 per cent under FP4 to 2.05 per cent under FP7 (to date).

Figure 5 below shows the proportion of total funding that was allocated to Denmark in each of

FP5, FP6 and FP7, as well as the change in this share over the course of three FPs. The same data for Denmark’s four main ‘comparator’ countries are also shown.

Denmark saw a steady decline in the proportion of overall funding allocations from 2.7 per cent in FP5 to 2.4 per cent in FP6 and then to 2.1 per cent in FP7. This represents a 12 per cent and 14 per cent fall respectively. Norway has similarly experienced a decline in both periods, with a similar proportionate fall as Denmark from FP5 to FP6 but a sharper fall from FP6 to FP7.

The Netherlands and Finland have seen more variation. The Netherlands experienced a small (3 per cent) increase from FP5 to FP6, but then a small (1 per cent) decline from FP6 to FP7, resulting in a small increase overall. Finland experienced a slight decline followed by a considerable increase, resulting in a share of FP7 funding that is considerably higher than under either of the previous FPs. Sweden is the only one of the five countries to have seen an increase in its share of

**Figure 5 – Funding allocation shares in FP5, FP6 and FP7 – Denmark and comparator countries**

Member State	Share of funding			% change in share	
	FP5	FP6	FP7	FP5 - FP6	FP6 - FP7
Denmark	2.7%	2.4%	2.1%	- 12%	- 14%
Sweden	3.8%	4.1%	4.2%	+ 7%	+ 4%
Finland	2.2%	2.1%	2.7%	- 5%	+ 29%
Norway	1.9%	1.7%	1.4%	- 12%	- 19%
Netherlands	6.4%	6.6%	6.6%	+ 3%	- 1%

Sources: FP5 data - 'Figures on Danish participation in FP6' (Forsknings-og Innovationsstyrelsen, August 2008), FP6 and FP7 data – FP6/7 participation data (E-CORDA, September 2009)

funding from FP5 to FP6 and from FP6 to FP7. It therefore again appears that while some other comparator countries have seen a decline in their share of FP funding from FP5-6 and/or from FP6-7, the fall in Danish funding share is at the upper end of the ranges seen.

It should be noted that the figures relating to Denmark's and other countries' performance in FP7 are subject to ongoing change, as further FP7 calls are issued and further data becomes available.

### 3.2.4 Denmark's level of FP funding in context

Further analyses of Denmark's level of FP6 and FP7 funding were conducted and compared to that of other Member States in order to place the level of 'return' to each country in context. The share of FP6 and FP7 funding (to date) have been compared to Member States' Gross Domestic Product (GDP), population, Gross Expenditure on Research and Development (GERD), and numbers of Full Time Equivalent (FTE) researchers<sup>2</sup>.

#### 3.2.4.1 FP6 funding in context

Under FP6, Denmark received 2.6 per cent of the funding allocations to the EU-25 Member States. This level of FP6 funding was calculated to be:

- 122 per cent higher than Denmark's share of EU-25 population
- 39 per cent higher than Denmark's share of EU-25 GDP
- 21 per cent higher than Denmark's share of EU-25 FTE researchers
- 3 per cent higher than Denmark's share of EU-25 GERD.

It is therefore clear that although Denmark's level of return from FP6 was lower than the levels realised in FP4 and FP5, the volume of EU funding received under FP6 can still be considered to be above its expected levels of return, particularly in relation to the size of its population.

Denmark was ranked:

- **2nd** out of the EU-25 in terms of its ratio of FP6 funding to its share of EU-25 **population**. Only Sweden was ranked higher
- **10th** out of the EU-25 in terms of its ratio of FP6 funding to **GDP**. The comparator Member States (SE, FI, NL) were all ranked higher than Denmark on this measure
- **10th** out of the EU-25 in terms of its ratio of FP6 funding to **FTE researchers**. The Netherlands was ranked more highly on this measure but both Sweden and Finland were ranked lower
- **18th** out of the EU-25 in terms of its ratio of FP6 funding to **GERD**. Again the Netherlands was ranked higher but both Sweden and Finland were ranked lower on this measure

These results show that, depending on the metric used to place FP6 funding in context, Denmark has performed either relatively well (e.g. in comparison with its population size) or relatively poorly (e.g. in comparison with its share of GERD). Overall, however, Denmark's level of participation in FP6 can generally be regarded as good / high on most measures, notwithstanding the fact that it has not done as well overall as it did during FP5.

#### 3.2.4.2 FP7 funding in context

The total budget for FP7 is €50,521 million, covering the period 2007-13<sup>3</sup>. It is important to note that, because FP7 is ongoing, the data used for the analysis of FP7 participation to date includes just €6,652 million of funding allocations, equivalent to 13.2 per cent of the total budget for FP7 as a whole.

Under FP7 to date, Denmark has received 2.3 per cent of the funding allocations to the EU-27 Member States. This level of FP7 funding was calculated to be:

2) Data for GDP, population, GERD and FTE researchers obtained from Eurostat

3) Amended proposal for a Decision of the European Parliament and of the Council, concerning the seventh framework programme of the European Community for research, technological development and demonstration activities (2007-13), COM(2005) 119 final/2

- 108 per cent higher than Denmark’s share of EU-27 population
- 25 per cent higher than Denmark’s share of EU-27 GDP
- 10 per cent lower than Denmark’s share of EU-25 FTE researchers
- 4 per cent higher than Denmark’s share of EU-25 GERD.

These data suggest that Denmark’s level of return from FP7 (to date) is higher than (25 per cent above) the level expected when compared to its share of GDP and, compared to its population, Denmark’s level of return is more than double the level expected. However, on all four of the measures presented above Denmark’s relative rate of return is lower for FP7 than it was for FP6. This finding has been further confirmed by analysis that shows Denmark is currently ranked:

- **5th** out of the EU-27 in terms of its ratio of FP6 funding to **population**
- **12th** out of the EU-27 in terms of its ratio of FP7 funding to **GDP**
- **13th** out of the EU-27 in terms of its ratio of FP7 funding to **FTE researchers**
- **23rd** out of the EU-27 in terms of its ratio of FP7 funding to **GERD**.

On each measure Denmark has therefore lost ground (2 or 3 places) against the other EU Member States.

The Member States contribute to the EU budget in proportion to their share of EU GDP, so the findings above tell us that Denmark’s funding

returns from the FPs continues to be above the level of its input. However, its relative share appears to be declining, though again it should be noted that FP7 is still underway and that improved performance in subsequent FP7 calls could mean that Danish involvement is improving rather than declining.

### 3.3 Participation in FP6 by type of organisation

The data supplied did not allow us to conduct an analysis of FP7 participation by type of organisation. The findings presented here therefore relate only to FP6 involvement.

#### 3.3.1 FP6 participations by organisation type

The standard classification of participants in FP6 by organisation (or ‘activity’) type contains four main categories. Figure 6 presents the breakdown of Danish participations by activity type and provides a comparison with the breakdown for all FP6 participations. It should be noted that the figures are known not to be 100 per cent accurate due to variability in the categorisation of organisations by activity type, wherein the same organisation is often allocated to several different activity types across their various participations. In addition, the activity type is not specified for several hundred organisations.

These limitations notwithstanding, the data show that Denmark’s participation profile in terms of participation by different types of organisation

Figure 6 – Breakdown of Danish FP6 participations and all FP6 participations, by activity type

Activity Type	Number (and share) of participations - Denmark	Number (and share) of participations - FP6 overall
Higher Education	723 (44%)	26,490 (36%)
Industry	297 (18%)	13,908 (19%)
Research Institutes	303 (19%)	20,621 (28%)
Other	303 (19%)	12,371 (17%)
<b>Total<sup>4</sup></b>	<b>1,626 (100%)</b>	<b>73,390 (100%)</b>

Source: FP6 participation data (E-CORDA, September 2009)

4) The activity type of 15 Danish participations and 1,010 of participations overall in FP6 are unknown and have therefore been excluded from the totals

follows fairly closely that of FP6 as whole. Higher Education Institutions (HEIs) from Denmark account for slightly more of the Danish total (44 per cent) than the FP6 average (36 per cent), and Danish research institutes account for slightly less than the FP6 average (19 per cent versus 28 per cent). Danish industry's share and the share of participations accounted for by 'Other' Danish organisations are roughly in line with FP6 averages.

### 3.3.2 FP6 funding by organisation type

Danish organisations were allocated a total of €395.8 million in funding from FP6, out of a total allocation of €16.7 billion. Danish organisations therefore received 2.37 per cent of all FP6 funding.

The average volume of FP6 funding allocated to each Danish participant was €568k. Across FP6 as a whole the average amount of funding per participant is calculated to be €514k, so Danish organisations received 11 per cent more than average. The average volume of FP6 funding allocated to Danish organisations was €241k per participation. This is around 8 per cent higher than the average for FP6 as a whole (€224k). Overall, then, Danish participants have realised higher than average levels of funding than the averages for all participating countries.

Some significant variations were identified at the level of the four main types of participating organisation, as follows:

- Danish HEIs were allocated a total of €204.6 million in funding. This represented 52 per cent of all FP6 funding to Danish organisations, a significantly larger share than that obtained by all HEIs across FP6 as a whole (37 per cent). Danish HEIs received an average of €285k in funding per participation, 23 per cent above the FP6 average of €232k per HEI participation
- Danish industry received €47.9 million in funding. This represented 12 per cent of Denmark's total, significantly below the share of funding obtained by industry across FP6 as a whole (18 per cent). The average amount of funding provided to Danish industry per participation was €161k,

significantly below the overall FP6 average of €218k per industrial participation. The low level of funding received by Danish industry overall has therefore been driven primarily by low levels of funding 'per participation' (as opposed to a low number of participations)

- Danish research institutes were allocated €80.9 million in funding. This represented 21 per cent of Denmark's total, below the overall share of 32 per cent obtained by research institutes across FP6 as a whole. The average amount of funding per Danish research institute participation was €267k, slightly above the overall FP6 average of €253k per research institute participation
- Other Danish participants were allocated €60.4 million in funding. This represented 15 per cent of Denmark's total funding from FP6, broadly in line with the 13 per cent share received by 'other' organisations across FP6 as a whole. The average amount of funding per participation was €195k, 14 per cent above the FP6 average of €172k per participation by the 'other' organisations.

## 3.4 FP6/7 participation by Thematic Priority Area

### 3.4.1 Danish participation within FP6 Thematic Areas

FP6 was made up of three specific programmes<sup>5</sup>, which were further subdivided into 17 Thematic Priority Areas. Figure 7 lists the 17 Priority Areas and shows the number of Danish projects and participations, and the volume of EC funding allocated to Danish participations within each. It indicates that in terms of numbers alone the **Life sciences, genomics and biotechnology** and **Sustainable development** areas were the most significant, with over 150 projects, over 200 participations and in excess of €80 million in funding achieved by Denmark in each.

Figure 7 also shows the *share* of all FP6 projects, participations and EC funding accounted for by Danish participation for each Priority Area. Arrows (↕↔) have been used to symbolise whether

5) 1. Integrating and Strengthening the European Research Area;  
2. Structuring the European Research Area;  
3. Nuclear Research (Euratom)

Denmark has performed comparatively strongly or less well in each area, as compared to Denmark's overall performance in FP6. For example, across FP6 as a whole Denmark participated in 11.1 per cent of the projects, so we can say that a project participation rate of 12 per cent in the research infrastructures area is 'close to average' (↔) while involvement in 25 per cent of life sciences projects is 'above' average (↑).

The results indicate that Denmark has performed strongly in the *Life sciences, Food quality and safety, Sustainable development, Policy support, Science and society* and *Support for coordination of activities* Priority Areas.

The areas of weakest performance appear to be the *Information society technologies, Aeronautics and space, Support for international cooperation, Research infrastructures, Development of Research and Innovation (R&I) policies, and Euratom* Priority Areas.

Given the central importance of the **Health** (life sciences) and **Food** thematic areas to the Danish research landscape and economy, it is reassuring to see a strong comparative performance in these priority areas. The picture for the third thematic area of focus for this study (Nanotechnology) is more mixed, with an above average project participation rate, a 'close to average' participation rate and a below average share of funding for this Priority Area. These data suggest that Danish actors have had a good level of involvement in the Nanotechnology Priority Area, but have probably not in most cases had a leading or particularly large role in the projects in which they have participated.

### 3.4.2 Danish participation within FP7 Thematic Areas

FP7 is made up of five specific programmes<sup>6</sup>, which are further subdivided into 22 Thematic Priority Areas. Figure 8 lists the 22 Priority Areas and shows the number of Danish projects and participations, and the volume of EC funding allocated to Danish participations within each.

It indicates that in terms of numbers alone the *Health* and *Information and Communication Technologies (ICT)* areas are the most significant to date, with over 50 projects, over 60 participations and in excess of €20 million in funding achieved by Denmark in each.

Figure 8 also shows the *share* of all FP7 projects, participations and EC funding accounted for by Danish participation for each Priority Area. Arrows (↑↔) have again been used to symbolise whether Denmark has performed comparatively strongly or less well in each area, as compared to Denmark's overall performance in FP7.

The results indicate that Denmark has performed strongly in *Energy, Environment (including climate change), Food, agriculture & biotechnology, and Health* areas. These are all areas where Denmark also saw strong performance (in the equivalent priority area) in FP6.

The areas of weakest performance appear to be the *Activities of international cooperation, Coherent development of research policies, and Research potential* areas (where there has been no Danish participation at all to date), as well as the *European Research Council* area (where Danish shares are low across the three indicators). Again, these are areas where Denmark also saw a relatively weak performance in the related areas of FP6, where they existed.

Given the central importance of the *Health* and *Food* thematic areas to the Danish research landscape and economy, the continued (from FP6) strong performance in these areas in FP7 across all indicators is very positive. Denmark's shares of projects, participation and funding in the *Nanosciences* area of FP7 are also now above its overall average level of performance, which reflects an improved situation from FP6. This is also a positive result indicating that Denmark is taking a more active role within this promising new field.

6) 1. Cooperation;  
2. Ideas;  
3. People;  
4. Capacities;  
5. Nuclear Research

Figure 7 - Danish FP6 projects, participations and EC funding, by Priority Area

Priority	Projects	Participations	EC funding (€ million)	Project share	Participation share	EC funding Share
1. Life sciences, genomics and biotechnology	150	203	80.3	25% ↑	3.0% ↑	3.5% ↑
2. Information society technologies	134	199	48.6	12% ↔	1.4% ↓	1.3% ↓
3. Nanotechnologies and nanosciences	76	107	25.7	17% ↑	1.8% ↔	1.7% ↓
4. Aeronautics and space	21	23	4.4	9% ↔	0.7% ↓	0.4% ↓
5. Food quality and safety	60	138	52.9	32% ↑	4.3% ↑	7.0% ↑
6. Sustainable development	175	314	83.7	26% ↑	3.0% ↑	3.7% ↑
7. Citizens and governance	35	44	4.9	24% ↑	2.3% ↔	2.0% ↔
Policy support/Science & Technology needs	115	157	20.2	22% ↑	3.4% ↑	3.4% ↑
Horizontal research activities – SMEs	73	122	10.7	15% ↑	2.2% ↔	2.3% ↔
Support for international cooperation	25	29	5.3	7% ↓	1.2% ↓	1.5% ↓
Research and innovation	21	33	5.3	9% ↔	1.8% ↔	2.3% ↔
Human resources and mobility	157	171	40.1	3% ↓	2.0% ↔	2.3% ↔
Research infrastructures	19	22	4.9	12% ↔	1.2% ↓	0.7% ↓
Science and society	21	30	2.5	13% ↔	2.9% ↑	3.2% ↑
Support for the coordination of activities	32	38	5.0	31% ↑	3.2% ↑	1.7% ↓
Development of R & I policies	1	2	0.1	5% ↓	1.2% ↓	0.5% ↓
Euratom	6	9	1.1	8% ↓	0.8% ↓	0.6% ↓
<b>Total</b>	<b>1,121</b>	<b>1,641</b>	<b>395.8</b>	<b>11.1%</b>	<b>2.21%</b>	<b>2.37%</b>

Source: FP6 participation data (E-CORDA, September 2009)

Figure 8 - Danish FP7 projects, participations and EC funding, by Priority Area

Priority	Projects	Participations	EC funding (€ million)	Project share	Participation share	EC funding Share
Energy	21	35	12.6	25% ↑	3.8% ↑	4.5% ↑
Environment (including Climate Change)	22	27	8.5	28% ↑	2.6% ↑	3.9% ↑
Food, Agriculture, and Biotechnology	21	29	7.3	27% ↑	2.9% ↑	3.1% ↑
General Activities (Annex IV)	1	1	0.2	11% ↑	3.4% ↑	0.2% ↓
Health	51	69	30.0	22% ↑	2.9% ↑	3.2% ↑
Information and Communication Technologies	51	67	24.4	9% ↔	1.2% ↓	1.2% ↓
Nanosciences, Nanotechnologies, Materials and new PT	26	35	14.0	24% ↑	2.4% ↑	3.1% ↑
Security	7	7	1.1	21% ↑	1.9% ↔	1.2% ↓
Socio-economic sciences and Humanities	10	11	1.8	13% ↑	1.8% ↔	1.8% ↓
Space	4	4	0.6	22% ↑	1.3% ↓	0.4% ↓
Transport (including Aeronautics)	7	11	8.2	8% ↔	1.0% ↓	2.3% ↑
Activities of International Cooperation	0	0	-	0% ↓	0.0% ↓	0.0% ↓
Coherent development of research policies	0	0	-	0% ↓	0.0% ↓	0.0% ↓
Regions of Knowledge	2	3	0.3	8% ↔	1.3% ↓	2.1% ↔
Research for the benefit of SMEs	19	26	3.9	15% ↑	2.1% ↑	2.5% ↑
Research Infrastructures	18	18	4.5	19% ↑	1.4% ↓	1.3% ↓
Research Potential	0	0	-	0% ↓	0.0% ↓	0.0% ↓
Science in Society	6	7	0.4	17% ↑	2.4% ↑	1.6% ↓
Marie-Curie Actions	34	38	10.5	3% ↓	1.5% ↓	2.3% ↑
European Research Council	7	7	7.8	1% ↓	1.4% ↓	1.2% ↓
Fusion Energy	2	2	0.1	67% ↑	3.1% ↑	2.1% ↓
Nuclear Fission and Radiation Protection	2	2	0.1	8% ↔	0.6% ↓	0.2% ↓
<b>Total</b>	<b>311</b>	<b>399</b>	<b>136.4</b>	<b>8.8%</b>	<b>1.9%</b>	<b>2.05%</b>

Source: FP7 participation data (E-CORDA, September 2009)

## 3.5 FP6/7 participation by Type of Instrument

### 3.5.1 Danish participation within FP6 Instruments

FP6 employed a range of different Types of Instruments (projects and actions) to implement its priorities, with a different profile of Instruments being used within each Priority Area. The ten Instruments employed by FP6 were as follows:

- **Networks of Excellence (NoEs)** – Multipartner projects aimed at strengthening excellence on a research topic by networking the critical mass of resources and expertise around a joint programme of activities. They are aimed primarily at creating a progressive/lasting integration of the research activities of the network partners, while also advancing knowledge on the topic
- **Integrated Projects (IPs)** – Multipartner projects to support objective-driven research, where the primary deliverable is knowledge for new products, processes, services, etc. They should bring together a critical mass of resources to reach ambitious goals aimed either at increasing Europe's competitiveness or at addressing major societal needs
- **Specific Targeted Research Projects (STREPs)** – Multipartner research, demonstration or innovation projects to support research, technological development and demonstration or innovation activities of a more limited scope and ambition, particularly for smaller research actors and participants from candidate countries
- **Coordination Actions (CAs)** – Actions to promote and support the networking and coordination of research and innovation activities. They cover the definition, organisation and management of joint or common initiatives as well as organisation of conferences, meetings, performance of studies, exchanges of personnel, exchange and dissemination of good practices, setting up of common information systems and expert groups
- **Specific Support Actions (SSAs)** – Single or multipartner activities intended to complement the implementation of FP6 and may be used to help in preparations for future Community research policy activities. The actions support conferences, seminars, studies and analyses, working groups and expert groups, operational support and dissemination, information and communication activities, or a combination of these
- **Co-operative Research Projects (CRAFT)** – Undertaken for the benefit of a number of SMEs from different countries on common specific problems
- **Collective Research Projects (CLR)** – Carried out on behalf of industrial associations/groupings in sectors where SMEs are prominent, to expand the knowledge base of SMEs
- **Integrated Infrastructure Initiatives (I3)** – Combine several activities essential to reinforce research infrastructures and provide an integrated service at the European level. They cover networking, provision of access to transnational users and joint research activities
- **Specific Actions to Promote Research Infrastructures (II)** – To support the integrated provision of infrastructure related services to the research community at European level, inducing a long-term integrating effect on the way research infrastructures operate, evolve and interact with each other and their users, contributing to the development of the ERA
- **Marie Curie Actions (MCAs)** – These actions provide a variety of possibilities for individual researchers in different stages of their career, and for institutions acting as a host for fellows.

Figure 9 shows the numbers of projects and participations in which Denmark was involved, and the volume of EC funding achieved for each of the ten main types of instrument used in FP6. As with the Priority Areas, the various Instruments were used to a greater or lesser degree across FP6 and so it is not possible to draw firm conclusions on the performance of Denmark from this table. However, in terms of numbers alone Danish participation was highest for Specific Targeted Research Projects (STREPs) and Integrated Projects, with over 200 projects, over 400 participations and in excess of €100 million in funding achieved by Denmark for both Types of Instruments.

Figure 9 also shows Danish projects, participations and EC funding expressed as a share of the FP6 totals for each Type of Instrument. The results indicate that Denmark has performed comparatively strongly in terms of its share of projects, participations and funding for Integrated Projects and Coordination Actions, and that it has performed comparatively well in terms of its share of participations and share of projects for Networks of Excellence (NoEs) and Co-operative Research Projects (CRAFT) (with a proportionate share of funding in these cases). Denmark has also performed well in terms of its involvement in the STREPs and has achieved a proportionate share of participations and funding for this Instrument.

Denmark's involvement in Collective Research Projects and the two Infrastructure Initiatives (I3 and II) have also been high in terms of the share of projects, but the Danish share of participations and funding for these instruments is below average. This suggests that while Denmark has participated in many of the projects, so have a large number of other partners, diluting Denmark's share of the participations and funding.

For Marie Curie Actions (MCAs), Denmark's share of projects is significantly below average, while both its share of participations and its share of funding were close to average for MCAs. These results can be explained by the fact that the number of consortia in each MCA is very low (in comparison with other Instruments), so most countries' share of MCA projects is not much higher than their share of MCA participations.

Denmark's relative involvement in Specific Support Actions was rather low across all of the indicators (share of projects, participations and funding).

### 3.5.2 Danish participation within FP7 Instruments

FP7 employed a much broader range of different Types of Instruments to implement its priorities than was the case in FP6. Because FP7 is still underway and due to the larger number of different Instruments employed in FP7 it is not possible to determine at this stage whether Denmark has performed particularly well (or badly) in relation to any specific Instrument.

Figure 9 - Danish FP6 projects, participations and EC funding, by Type of Instrument

Instrument	Projects	Participations	EC funding (€ million)	Project share	Participation share	EC funding Share
Networks of Excellence (NoEs)	81	130	30.65	47% ↑	2.5% ↑	2.4% ↔
Integrated Projects (IPs)	229	423	175.66	33% ↑	2.4% ↑	2.6% ↑
Specific Targeted Research Projects (STREPs)	336	483	106.02	15% ↑	2.3% ↔	2.4% ↔
Coordination Actions (CAs)	134	178	17.40	28% ↑	2.5% ↑	2.9% ↑
Specific Support Actions (SSAs)	102	126	11.38	7% ↓	1.5% ↓	1.2% ↓
Co-operative Research Projects (CRAFT)	54	90	7.95	14% ↑	2.4% ↑	2.5% ↔
Collective Research Projects (CLR)	14	24	2.24	16% ↑	1.4% ↓	1.5% ↓
Integrated Infrastructure Initiatives (I3)	3	3	0.52	27% ↑	0.9% ↓	0.3% ↓
Specific Actions to Promote Research Infrastructures (II)	12	15	4.01	14% ↑	1.6% ↓	1.2% ↓
Marie Curie Actions (MCAs)	156	169	39.93	3% ↓	2.1% ↔	2.3% ↔
<b>Total</b>	<b>1.121</b>	<b>1.641</b>	<b>395.80</b>	<b>11.1%</b>	<b>2.2%</b>	<b>2.4%</b>

Source: FP6 participation data (E-CORDA, September 2009)

### 3.6 Denmark's role in FP6/7 projects

#### 3.6.1 Danish coordination of FP6 projects

Participants in the Framework Programmes can occupy either the (central) role of project coordinator or act as one of the participants. Analysis of Denmark's involvement in FP6 reveals that Danish actors occupied the role of project coordinator in 209 cases, or 19 per cent of the projects in which Denmark was involved. This means that the Danish participants were in a coordinating role for 13 per cent of all Danish FP6 participations, just below the FP6 average of 14 per cent.

While Denmark's FP6 coordination rate is slightly below the FP6 average a number of other factors should be considered which also provide indications as to the strength or the Danish partners' role in the projects.

The first indicator is derived from a comparison of Denmark's share of participations with its share of funding. Under FP6 Denmark realised 2.21 per cent of the participations but 2.38 per cent of the funding, which means that its average level of funding per participation (€241k) was higher than the overall FP6 average (€221k). This suggests that Danish participants may have had a slightly stronger or fuller role in its FP6 projects than the average.

The second point to consider is that the likelihood of being a project coordinator varies significantly depending on the Type of Instrument in which organisations are involved. For example, the NoEs supported under FP6 had an average of 30 partners and the ratio of coordinators to participants within this Type of Instrument is relatively low (3 per cent). However, Marie Curie actions have an average of only two partners, so coordinator to participant ratios are high (55 per cent). Because Danish participation rates in the Marie Curie actions was slightly below average, and its participation rate in the larger Instruments (NoEs and IPs) was slightly above average, it is not surprising to discover that its overall level of coordination of FP6 projects was slightly below the average for FP6 as a whole.

Analysis of Danish coordination rates in the different FP6 priorities revealed that Denmark had higher than average coordination rates in six of the 17 FP6 Priority Areas. Danish coordination rates were particularly high in the *Support for International Cooperation area*, and were above average in the *Life sciences, Aeronautics and space, Food quality and safety, Sustainable development, Science and society* and *Horizontal Research Activities (SMEs)* areas. While the coordination rates were higher than average in these areas, in some cases, Danish participation levels were low, so the actual number of projects coordinated by Danish actors was also low.

Analysis of the activity (organisation) type of the Danish coordinators revealed that HEIs and Research Institutes were most likely to fulfil this role, occupying the position of coordinator in 17 per cent and 13 per cent of participations respectively. Industry participants were coordinators in 7 per cent of their participations, while for 'other' organisations the figure was 9 per cent.

#### 3.6.2 Danish coordination of FP7 projects

Analysis of Denmark's FP7 participations reveals that the Danish partner has occupied the role of project coordinator in 59 cases, or 19 per cent of the projects in which Danish participants have been involved. This means that the Danish participants were in a coordinating role for 15 per cent of all Danish FP7 participations, slightly below the FP7 average of 17 per cent.

The number of Danish coordinators to date is too small to provide a meaningful analysis of patterns of coordination across the numerous FP7 Instruments. However, Denmark's level of involvement in the Marie Curie actions is relatively low in FP7, as was the case in FP6, so it is again likely that this is the primary reason why Danish coordination rates in FP7 are below average. Denmark's average level of funding per participation under FP7 to date (€342k) is above the FP7 average (€309k) suggesting that Danish organisations have occupied a significant role in the projects in which they have participated.

### 3.7 Danish participation in FP7 – latest information

The EuroCenter maintains information on contracts awarded and success rates in FP7, including those with Danish involvement. Towards the end of this study, DASTI provided the latest available headline figures from the EuroCenter on FP7, covering contracts awarded up to November 2009. The latest overall statistics on Danish participation in FP7 (i.e. up to November 2009) are as follows:

- **Projects** – Danish organisations have been involved in 680 projects, out of a total of 6,913. Danish organisations have therefore been involved in 9.8 per cent of all FP7 projects to date. This is an increase on the participation figures for the early period of FP7 quoted above, but still below the 11.1 per cent seen in FP6
- **Participations** – The total number of Danish participations is 901, out of a total of 44,317 for the whole of FP7 to date. Denmark's participations therefore constitute 2.0 per cent of the total, slightly higher than the earlier results for FP7 (1.9 per cent), but below the 2.2 per cent rate seen in FP6
- **Funding** – Danish organisations have now been allocated a total of €324 million in funding from FP7, out of a total allocation of €13.0 billion. Danish organisations have therefore received 2.49 per cent of all FP7 funding to date. This is higher than suggested by earlier figures (2.05 per cent) and also slightly (4 per cent) higher than the proportion of funding received in the whole of FP6 (2.37 per cent).

Overall there appears to have been a slight increase in Danish involvement in FP7 over recent calls in comparison with the earlier stages of the programme. Even so, at this stage Denmark's share of all FP7 projects and participations is still below the rates seen in FP6.

Denmark's share of FP7 funding, however, is now above its FP6 rate. This is because the average amount of funding per Danish participation has increased, both overall and relative to the average

for all participations. In FP6, the amount of funding per Danish participation was €241 million, which was 8 per cent higher than the overall FP6 average of €224 million. In FP7 to date, the amount of funding per Danish participation has been €360 million, which is 22 per cent higher than the overall FP7 average of €294.

### 3.8 Extent of demand for FP participation

A full database of Danish participations in FP6 proposals was made available to the study team, permitting analysis of both levels of demand (presented here) and success rates within the competition (presented in section 3.9 below). However, the data provided on Danish participation in FP7 proposals was found to be incomplete and therefore not a reliable basis from which to draw conclusions about the extent of Danish demand for participation in FP7 or of the success rates achieved to date.

#### 3.8.1 Proposals submitted to FP6 with Danish participation

Following cleaning of the FP6 application data, the number of discrete *proposals* in which Danish applicants were named as prospective participants was calculated to be 4,807. Data published by the European Commission indicated that the total number of proposals submitted to FP6 was 55,597, so Denmark's participation rate within FP6 proposals is calculated as 8.6 per cent. This is an indicator of the level of 'demand' for participation in FP6 by Danish organisations.

Figure 10 shows the breakdown of FP6 proposals with Danish involvement, by Priority Area. In terms of numbers alone, proposals with Danish participation were most numerous in the Human resources and mobility and Information society technologies areas, with over 700 proposals in each case.

The Figure also shows the breakdown of *all* FP6 proposals by Priority Area. By comparing all proposals with those with Danish participation,

Figure 10 – Denmark’s participation in FP6 proposals, by Priority Area

Priority	All proposals	Danish proposals	Demand - share of bids with Danish involvement
1. Life sciences, genomics & biotechnology	2,442	458	19%
2. Information society technologies	7,627	722	9%
3. Nanotechnologies and nanosciences	2,810	409	15%
4. Aeronautics and space	805	54	7%
5. Food quality and safety	1,145	246	21%
6. Sustainable development	2,763	487	18%
7. Citizens and governance	886	179	20%
Joint Calls (3-IST & 4-Nanotech)	145	29	20%
Joint Calls (4-Aero/space & 6-Sust Dev)	1,002	109	11%
Policy support/S&T needs	2,745	344	13%
Horizontal research activities - SMEs	3,980	445	11%
Support for international cooperation	2,759	109	4%
Research and innovation	762	80	10%
Human resources and mobility	23,464	895	4%
Research infrastructures	514	62	12%
Science and society	1,406	114	8%
Support for the coordination of activities	241	41	17%
Development of R & I policies	140	11	8%
Euratom	321	13	4%
<b>Total</b>	<b>55,957</b>	<b>4,807</b>	<b>9%</b>

Source: FP6 proposal data (E-CORDA, September 2009)

the final column gives an indication of the relative level of demand for involvement in each area. It shows that Denmark’s proposal participation rate was highest in proposals submitted to the Food quality and safety, Citizens and Governance, Information society technologies and Nanotech (joint call), and Life sciences areas. Danish proposal participation rates were lowest in the Support for international cooperation, Human resources and mobility, and Euratom areas.

An analysis of FP6 proposals with Danish participation by Type of Instrument was also carried out. In terms of numbers alone, proposals with Danish participation were highest for Specific Targeted Research Projects (STREPs), Marie Curie Actions, and Integrated Projects, with over 800 proposals for each Type of Instrument. Denmark’s proposal participation rate (expressed as a share of all submitted proposals) was highest in proposals submitted in relation to Networks of Excellence and Integrated Projects. Danish participation rates were lowest (and below average) in relation to Marie Curie Actions and Specific Support Actions.

Danish actors occupied the role of coordinator in 20 per cent of proposals with a Danish participant.

### 3.8.2 Danish participations in proposals submitted to FP6

After removing duplicate records, the actual number of Danish *participations* in FP6 proposals is taken to be 6,746. The Commission data indicates that there were a total of 389,737 participations in all of the submitted proposals received under FP6, so Denmark’s share of the participations in proposals is calculated as 1.7 per cent. This is an indicator of the level of ‘demand’ for participation in FP6 by Danish organisations.

Given that there were 6,746 Danish participations in 4,807 proposals, it is clear that in some of the proposals there were multiple Danish partners involved. In fact, there were 1,158 proposals with more than one Danish participant, equating to a quarter (24 per cent) of all proposals involving Danish actors. The majority of these proposals included just 2 or 3 Danish partners, but 176 proposals included greater numbers (up to 13 Danish participants in one particular case).

The proportion of proposals with multiple Danish participations varied considerably across the different FP6 priority areas and instruments. For example, in the case of three priority areas (Joint aeronautics and space, Horizontal research activities, and Food quality and safety), over one-third of proposals with Danish involvement included more than one Danish participant, whereas in two Priority Areas (Human resources and mobility, and Euratom), less than 10 per cent of Danish proposals included more than one Danish participant. Similarly, whilst more than one-third of Danish proposals to the IP and SME Instruments included >1 Danish participation, less than 10 per cent of Danish proposals to the MCA instrument did. The different levels of collaboration within the different instruments largely account for these differences.

Figure 11 provides a breakdown of Danish participations in proposals by organisation type. It shows both the number of participations and the share of participations accounted for by each group. It indicates that the majority of proposal participations were accounted for by HEIs. No data on participation by each group in FP6 proposals overall is available, so it is not possible to determine whether the profile of Danish demand is similar to that for all countries.

### 3.9 Success rates within the competition

#### 3.9.1 Danish FP6 success rates

##### 3.9.1.1 Danish success rates in applying to FP6

As indicated above, Danish organisations participated in 4,807 FP6 proposals and in 1,121 FP6 projects, so Denmark’s overall project-level success rate was 23 per cent, significantly above the average success rate for FP6 as a whole, which was 18 per cent. This indicates that proposals with Danish participation have performed well overall.

##### 3.9.1.2 Danish success rates by FP6 Priority Area

Figure 12 shows the success rates of proposals with Danish participation and compares these to the overall success rates for all proposals submitted to FP6, by FP6 Priority Area. It shows that Danish proposal success rates were above the FP6 average in 14 of the 17 Priority Areas (excluding joint calls), with Denmark performing particularly well in the following areas, where Danish success rates were more than 50 per cent higher than the FP6 averages: *Sustainable development; Euratom; International cooperation; Coordination of activities; Policy support; Science and society; Food quality and safety.*

Figure 11 – Denmark’s participation in FP6 proposals, by organisation type

	Number of Danish participations in proposals	Share of Danish proposal participations
HEIs	2,470	38%
Research Institutes	1,659	25%
Industry	1,463	22%
Other	973	15%
<b>Total</b>	<b>6,565*</b>	<b>100%</b>

Source: FP6 proposal data (E-CORDA, September 2009)

\*Note that this figure omits 181 participations in proposals where the activity type of the Danish organisation was not provided

Danish proposal success rates were slightly below average in the Human resources & mobility, and Research & innovation areas, and well below average in the Research & innovation policies area.

### 3.9.1.3 Danish success rates by FP6 Instrument

The success rates of proposals with Danish participation were analysed by FP6 Instrument, overall and in comparison with FP averages. It shows that Danish proposal success rates were above average for most of the Instruments, with Denmark performing particularly well on Integrated Projects and Coordinated actions. Danish proposal success rates were slightly below average on the SME-specific instruments and Marie Curie Actions.

## 3.9.2 Danish FP7 success rates

### 3.9.2.1 Danish success rates in applying to FP7

According to the latest information provided by EuroCenter (covering contracts awarded up to November 2009), Danish organisations have participated in 2,699 FP7 proposals and in 680

FP7 projects. This means that Denmark's overall project-level success rate is now 25 per cent, significantly above the latest average success rate figures for FP7 as a whole (21 per cent). Denmark's overall projectlevel success rate in FP7 is also above its success rate for FP6 (23 per cent).

### 3.9.2.2 Danish success rates by FP7 Priority Area

Danish proposal success rates were above the FP7 average in 18 of the 22 Priority Areas, with Denmark performing particularly well in the following areas, where Danish success rates were more than 50 per cent higher than the FP7 averages:

- Fusion Energy
- Space
- Environment (including Climate Change)
- Security
- Regions of Knowledge

Danish proposal success rates were slightly below average in relation to Marie-Curie Actions and

Figure 12 – Danish and all FP6 proposal success rates by Priority Area

Priority	Danish proposals	Danish projects	Proposal success rate - Denmark	Proposal success rate - all FP6	Ratio of Danish success rates to FP6 success rates
1. Life sciences, genomics & biotechnology	458	150	33%	25%	134% ↑
2. Information society technologies	722	134	19%	14%	130% ↑
3. Nanotechnologies and nanosciences	409	76	19%	15%	117% ↑
4. Aeronautics and space	54	21	39%	30%	130% ↑
5. Food quality and safety	246	60	24%	16%	151% ↑
6. Sustainable development	487	175	36%	18%	150% ↑
7. Citizens and governance	179	35	20%	16%	119% ↑
Joint Calls (3-IST & 4-Nanotech)	29			0%	
Joint Calls (4-Aero/space & 6-Sust Dev)	109			0%	
Policy support/S&T needs	344	115	33%	19%	176% ↑
Horizontal research activities - SMEs	445	73	16%	12%	133% ↑
Support for international cooperation	109	25	23%	12%	185% ↑
Research and innovation	80	21	26%	31%	84% ↓
Human resources and mobility	895	157	18%	20%	90% ↓
Research infrastructures	62	19	31%	30%	102% ↑
Science and society	114	21	18%	11%	161% ↑
Support for the coordination of activities	41	32	78%	42%	184% ↑
Development of R & I policies	11	1	9%	14%	67% ↓
Euratom	13	6	46%	24%	190% ↑
Total	4,807	1,121	23%	18%	130% ↑

Source: FP6 proposal data (E-CORDA, September 2009)

there have been no successful Danish proposals in the Activities of international cooperation, Coherent development of research policies, and Research potential areas.

### 3.9.2.3 Danish demand for participation in FP7

The latest available information on Denmark's involvement in FP7 (shown in Section 3.7) suggests that its share of participations is lower than in FP6. As discussed above, it also shows that success rates for FP7 proposals with Danish involvement continue to be high (at the same level above the overall average as was the case in FP6). The combination of these factors (continued high success rates and yet falling participation rates) would suggest that Denmark's demand for participation also continues to fall.

However, the fact that the share of FP7 funding allocated to Denmark is now higher than for FP6, as well as the fact that funding per Danish participation is even further above the average than was the case in FP6, do both show that while demand may not be increasing, Danish participants are taking on more important roles within FP projects.

## 3.10 Collaboration within FP6/7 projects

### 3.10.1 Overall extent of collaboration within FP6

One of the main objectives of the Framework Programmes is to promote and support collaboration between European and international actors in the research and technological development sphere. Through their 1,641 participations in 1,121 FP6 projects Danish actors have collaborated with a very large number of other organisations from a very large number of different countries:

- The number of *participations* in FP6 projects with Danish involvement, *excluding the Danish participations*, was 17,260, and average of just over 15 (non-Danish) partners per project
- Through its FP6 projects, Danish actors have collaborated with partners from 113 different countries

Further information on Danish collaboration partners under FP6 is set out below.

### 3.10.2 Collaboration between Danish organisations within FP6 projects

With 1,641 participations across 1,121 projects it is clear that, in some cases, more than one Danish partner was involved in the same FP6 project. In fact, there were 315 FP6 projects with more than one Danish partner (28 per cent of the projects in which Denmark was involved). The largest number of Danish participants in a single FP6 project was ten.

An analysis of the extent of intra-Denmark collaboration within each of the FP6 Priority Areas revealed that there have been intra-Denmark collaborations within all 17 FP6 priority areas. The Priority Areas where the level of intra-Denmark collaboration was highest (proportionately) were Food quality and safety (58 per cent), Horizontal research activities (42 per cent), Sustainable development (39 per cent) and Research and innovation (38 per cent). In addition, there was only one Danish project in the Development of R&I policies area and this had more than one Danish partner (therefore 100 per cent share).

An analysis of the extent of intra-Denmark collaboration within each of the main types of FP6 Instruments was also carried out. It revealed that there have been intra-Denmark collaborations within all types of FP6 projects, and at reasonably high levels, except for the I3 infrastructure projects (of which there were only three Danish projects, and none with intra-Denmark collaboration). It might have been anticipated that the highest level of intra-Denmark collaboration would take place within the IPs and NoEs, due to the larger numbers of partners involved in those Instruments. This is to some extent the case, with 33 per cent of the IPs and 41 per cent of the NoEs (with Danish involvement) involving intra-Denmark collaborations. However, it is within the SME-focused CLR projects that intra-Denmark collaboration has been highest, with half (50 per cent) of the (Danish) projects involving at least two Danish partners. The CRAFT projects were

also associated with relatively high levels of intra-Denmark collaboration (41 per cent). This reflects the nature of the SME-focused instruments, which involve networks of SMEs often in partnership with their (local) R&D performers / suppliers.

### 3.10.3 FP6 collaboration with actors from different countries

There were 17,260 participations by organisations from other countries in Danish FP6 projects, with the partners being drawn from a total of 113 different countries.

In volume terms the greatest number and share of EU Member State collaborations took place with partners in the UK and Germany (~12 per cent of Danish collaborations in each case), followed by France (~9 per cent) and Italy (~7 per cent). However, this reflects mainly the high levels of participation in FP6 by these countries as a whole. A better indicator of the strength of collaboration between Denmark and other countries is the ratio of each country's share of all participations in Danish projects to their overall share of FP6 participations. Using this indicator, the most active 'Member State' collaboration partners were Finland and Sweden (followed by the Netherlands) and the least active were Luxembourg, Malta and Romania.

The greatest numbers of collaborations with non-EU Member States were with Switzerland and Norway, with over 500 participations each. Norway was also one of the most significant collaboration partners (proportionately), the other being Iceland. Both collaborated with Denmark at a level at least two-thirds higher than might be expected given their overall levels of participations in FP6.

### 3.10.4 Collaboration between different types of organisation in FP6

The partners in the Danish FP6 projects break down by activity type as follows: Higher Education (HES) – 38 per cent; Industry (IND) – 15 per cent; Research (REC) – 32 per cent;

Other (OTH) – 16 per cent (excludes undefined records). This is broadly in line with Denmark's own participation breakdown, except that Denmark has considerably lower REC participation (19 per cent) and slightly higher participation by other activity types.

### 3.10.5 Overall extent of collaboration within FP7

Further information on Danish collaboration partners under FP6 is set out below.

Through the 399 participations in 311 FP7 projects to date, Danish actors have collaborated with a large number of other organisations from a range of countries. Overall statistics on the extent of this collaboration are as follows:

- The number of *participations* in FP7 projects with Danish involvement, *excluding the Danish participations*, is 3,558, an average of just over 11 (non-Danish) partners per project. This figure is slightly below the number for FP6, suggesting that FP7 consortia are smaller than those under FP6, at least within the projects with Danish involvement
- Through its FP7 projects, Danish actors have collaborated with partners from 80 different countries. Again this figure is below FP6 levels, but may simply reflect the fact that FP7 is still at a relatively early stage and we would expect to see the number of collaborative partner countries increase over the course of FP7.

Further information on Danish collaboration partners under FP7 is set out below.

### 3.10.6 Collaboration between Danish organisations within FP7 projects

There have been 68 FP7 projects with more than one Danish partner involved to date, or 22 per cent of the projects in which Denmark has been involved. This is below the level of intra-country collaboration under FP6 (28 per cent) and is almost certainly a reflection of the smaller average size of consortia under FP7, leaving less room for participations by partners from the same country.

### 3.10.7 Collaboration with actors from different countries

There have been 3,558 participations by organisations from other countries in Danish FP7 projects, with the partners being drawn from 80 different countries. In volume terms the greatest number and share of collaborations have taken place with partners in the UK, France and Germany (with 12 per cent, 12 per cent and 9 per cent of the collaborations each respectively), a similar situation to FP6 and again reflecting the high levels of participation in FP7 by these countries as a whole.

The most active Member State collaboration partners, based on the ratio of each country's share of all participations in Danish projects to their overall share of FP7 participations are Malta, Latvia and Estonia, each with at least a 50 per cent higher level of participation in Danish projects than in all FP7 projects. The least active Member

State partner by this indicator is Bulgaria. This indicates a different pattern of collaboration under FP7 than under FP6, with greater relative levels of collaboration with Eastern European countries, and a shift away from collaboration with comparator countries (specifically Finland, Sweden and the Netherlands).

There has been no such shift in the share of collaborations with *other* (non-EU member state) countries from FP6 to FP7. Again, Switzerland and Norway lead in terms of the number of participations in Danish projects, with 123 and 79 participations respectively. Norway is also one of the most significant collaboration partners (proportionately), the others being Iceland and 'the EU'. All three collaborated with Denmark at a level at least 50 per cent higher than might be expected given their overall levels of participations in FP7.

#### 4. Danish strategies for participation and the benefits realised



## 4.1 Introduction

This section of the report presents feedback on Danish participation in the Sixth and Seventh Framework Programme, focusing on the strategies for participation and the benefits realised. It is based on feedback obtained from a broad range of Danish actors, gathered through a questionnaire survey of FP6/7 participants and through a series of interviews with university support offices, reference group members, key participants (industrial and academic) and a small number of support providers and non-participants.

The term ‘strategies’ as used in this report relates to the full range of practices and processes employed by the relevant actors to support and strengthen their role in the FPs and to maximise the benefits realised. These strategies do not have to be formally documented or made explicit in order to be considered. Similarly the term ‘benefits’ relates to any form of positive outcome or impact realised as a result of participation in the FPs.

This section follows a ‘chronological’ order, beginning with discussion of the **relevance** of the FPs to Danish Research and Development (R&D) performers, and a review of the strategies in place to influence the FP in order to increase its relevance. We then go on to look at Danish **demand** for participation, and the strategies and incentive systems in place nationally and at an institutional level in order to maintain and increase demand. Next we discuss Denmark’s **success rates** in applying to the FPs, and the strategies and support measures that are aimed at enhancing Danish fortunes within the competitions. We then go on to look at strategies for **participation** in the projects and for managing maximum value from the collaborations. Finally, we look at the **benefits and impacts** of Danish participation in FP projects, investigating what kinds of outputs and benefits are generated and how the results are exploited.

## 4.2 Strategies for increasing the relevance of the FPs

### 4.2.1 The relevance of FP6 and FP7 topics and instruments

Participants were asked through the questionnaire survey to rate the relevance of the research topics / Priority Areas covered in both FP6 and FP7 from the perspective of their own organisation or research group. For both FP6 and FP7, the majority of respondents rated them as of ‘high’ or ‘very high’ relevance, with only a small decline from FP6 (67 per cent) to FP7 (62 per cent). Most of the remaining participants stated that the research topics / Priority Areas were of ‘medium’ relevance from their perspective, while only a minority regarded the topics in FP6 (7 per cent) or FP7 (10 per cent) as of ‘low / very low’ relevance.

Questionnaire respondents were similarly asked to rate the forms of support (or Instruments) employed in both FPs in terms of their relevance to their own organisation or research group. The majority of respondents also rated the relevance of the Instruments as ‘high’ or ‘very high’ for both FPs (61 per cent in both cases) and only a minority regarded the Instruments employed in FP6 (10 per cent) or FP7 (9 per cent) as of ‘low / very low’ relevance to them.

Closer analysis of responses also suggests that from the perspective of the majority (75 per cent+) of individual organisations or research groups, the relevance of both the topics/Priority Areas and Instruments employed has not changed from FP6 to FP7.

Our programme of interviews confirmed this generally positive assessment. The university central support offices, reference group members and key participants consulted during the course of the study in most cases stated that there has been a strong alignment between Danish research strengths and FP6/7 priorities and calls and that the programmes provide good opportunities for Danish participation.

Some commentators argued that, particularly from the perspective of industry / SMEs, some of the FP calls are too specific, and that it is becoming increasingly common for the Commission to issue calls for specific projects that have already been largely defined in terms of their objectives, and that in some cases the Commission will even specify, for example, that certain countries should be included in the partnerships. This restricts the level of opportunity for some applicants, making it hard for them to find a suitable ‘home’ for the kinds of research projects that they wish to undertake. This naturally reduces the relevance of the calls for some actors, reducing levels of demand. However, there is also increasing recognition that the Commission is reluctant to make the calls too open or general as this results in very high levels of demand, large numbers of proposals and, inevitably, low success rates within the competition. The Commission has been criticised in the past for the high levels of abortive costs associated with very low success rates and so the Commission has sought to be clearer and more specific when laying out its priorities and the kinds of projects it wishes to support.

Most actors in Denmark have come to realise that there is little point (or necessarily any benefit) to arguing for more open calls, and that the best way to increase the relevance of the work programmes and the calls is to take an active role in their development. The Commission employs a number of defined routes through which it develops its work programmes and calls, and these provide opportunities for national ministries, consortia and institutions to influence their form and content.

Our programme of interviews also indicated that in many cases the FPs are becoming more relevant to Danish actors, not because of an improved fit between FP Priority Areas / Instruments and Danish research strengths, but because FP participation is being afforded increased priority within the national research and innovation system as a whole. Strong signals have emanated from the Ministry of Science, Technology and Innovation over the past 2-3 years, through a

variety of routes. These signals make it very clear that FP participation, and international collaboration more generally, is considered a desirable and important feature of Danish research and that the research communities and institutions are expected to play a full and active role. A range of mechanisms to support and encourage FP participation have been put in place, and these have exerted a positive impact on the extent to which Danish researchers view the Framework Programmes as relevant to them. These mechanisms are discussed in more detail in the following sections of this report.

#### 4.2.2 Strategies employed to increase the relevance of the FPs

##### 4.2.2.1 Adjustment of research strategies

Respondents to the questionnaire survey were asked to indicate the extent to which their own organisation or research group has adjusted its own research strategy to better align it with FP priorities and Instruments. Most (72 per cent) reported that they do adjust their research strategies, although in most cases this was only to a ‘small’ or ‘medium’, rather than ‘large’ extent. The proportion of respondents from industry and private research organisations reporting that they do not adjust their strategies at all (38 per cent) was significantly higher than the proportion of respondents from higher education and public research organisations (24 per cent).

Our interviews confirmed these findings, with most commentators stating that organisational strategies are primarily based, quite naturally, around an assessment of internal research capabilities / strengths coupled to an understanding of political, industrial and societal needs and priorities, primarily expressed at the national level. Institutional strategies can be modified slightly in light of EU-level priorities and funding opportunities, but it is more likely that efforts will be made to influence the latter to bring them into closer alignment with national research capabilities and trajectories than the other way round. In this sense, FP priorities do not drive planning at the national- or organisational-level, but it is not

uncommon for plans to be adjusted at the margins in order to provide a greater degree of alignment with EU-level priorities and opportunities.

#### 4.2.2.2 Influencing FP work programmes and calls

Participants were asked to indicate which of a range of mechanisms their organisation or research group has used to influence FP6/7 annual work programmes. More than three-quarters (78 per cent) of respondents reported having used at least one of the six main mechanisms listed in the questionnaire, with by far the most commonly used mechanism (used by 67 per cent) being *participation in conferences, workshops and other network activities*. The other mechanisms listed were much less widely used:

- Submission of expressions of interest (38 per cent)
- Input to FP6/7 Programme Committees (36 per cent)
- Participation on European Technology Platforms and / or input to Strategic Research Agendas (33 per cent)
- Participation on or input to FP Advisory Groups (28 per cent)
- Participation in Internet-based public consultations (16 per cent).

Other mechanisms that respondents have used to influence annual work programmes included: (i) direct contact with European Commission (EC) officials, (ii) communication with other researchers, and (iii) providing inputs via Danish national representatives.

Questionnaire respondents that had used any of the mechanisms for influencing the FP annual work programmes (described above) were asked to rate the effectiveness of these actions in improving the relevance of the work programmes from the perspective of their organisation or research group. The results are presented in Figure 13 and suggest very different experiences as to the effectiveness of the different mechanisms, with a relatively even split across users of *all* mechanisms between those who thought them ‘quite/very effective’ and those who thought them ‘not very/not at all effective’. Only a very small proportion of respondents consider any of the mechanisms to be *very* effective. However, *participation on European Technology Platforms* were considered ‘quite / very effective’ by at least half of those that have used these mechanisms, as has *participation in conferences, workshops and other networking activities* (the most widely used mechanism). Similarly, *input to FP6/7 Programme Committees* was considered to be quite / very effective by a (slim) majority of respondents who have provided such inputs.

Figure 13 – Effectiveness of mechanisms used to influence FP work programmes

Effectiveness:	Not at all	Not very	Quite	Very
Participation on European Technology Platforms and / or input to Strategic Research Agendas (n=99)	11%	25%	49%	14%
Participation in conferences, workshops and other network activities (n=207)	11%	30%	47%	12%
Input to FP6/7 Programme Committees (n=111)	20%	29%	46%	5%
Submission of expressions of interest (n=13)	18%	35%	37%	10%
Participation on or input to FP Advisory Groups (n=84)	8%	44%	40%	7%
Participation in Internet-based public consultations (n=48)	25%	40%	33%	2%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

Respondents were also asked to indicate the extent to which they felt that national agencies and representatives have been successful in influencing the form (i.e. Priority Areas/calls) and content (i.e. instruments) of FP6 and FP7 in line with Danish interests. Over three quarters (77 per cent) felt that national agencies and representatives had been successful to some degree in influencing the Priority Areas and calls of FP6/7. However, in most cases this was only to a ‘small extent’ - only one-third (32 per cent) of respondents felt national agencies had been successful to a ‘medium’ or ‘large’ extent in influencing the Priority Areas/calls. Similarly, most (72 per cent) of the respondents felt that national agencies had been successful in influencing the instruments employed in FP6/7. Again, less than one-third felt that they had been successful to a ‘medium’ or ‘large’ extent. There were no significant differences between the overall spread of responses in relation to FP7 compared with FP6.

Interviewees also reported mixed levels of success in their efforts to influence the work programmes. Many commentators suggested that Denmark is considered to be one of the weaker countries at ‘lobbying’ and influencing the work programmes but it has been strengthening its operations and the situation is improving in many areas. It is considered important for Denmark to continue to do all that it can to influence the FPs and to extend and improve its approaches wherever possible.

Our programme of interviews revealed further information on the strategies employed to influence FP work programmes and call texts, and their relative effectiveness, as follows:

#### **INPUTS TO PROGRAMME COMMITTEES**

The first and most commonly cited mechanism (by interviewees) for influencing the work programmes was the provision of inputs to FP Programme Committees. The Programme Committees operate under each FP Priority Area and constitute a primary route through which the Commission consults the Member States and associate countries on its draft work programmes

and on other political documents that set out research trajectories and plans. Denmark, like most Member States, typically has three representatives on each Programme Committee: one official from the Ministry, the National Contact Point for that area, and a leading Danish scientific expert, again from the subject area to which the Programme Committee relates.

The Programme Committees meet regularly to discuss and provide inputs to the developing FP research agendas and work programmes, and help to ensure that there is widespread support and approval for the Commission’s proposals. The Programme Committees vote on the work programmes and must approve them by a qualified majority before the Commission can formally adopt them.

The Ministry and its EuroCenter have recently strengthened its process for national dialogue on the draft work programmes by establishing Reference Groups linked to FP7 Priority Areas. To date seven Reference Groups have been set up and are each comprised of (10-20) representatives of Danish universities, research institutes and companies. The aim of the Reference Groups is to enhance Danish participation by advising on opportunities, identifying barriers, and by providing inputs to and comments on the draft work programmes. The members represent their organisations (rather than their own personal interests) and are asked to consult internally as to items that could be added to the work programmes or adjustments that could be made to the texts in order to enhance Danish participation. The Reference Groups have been described as a welcome addition to Denmark’s approach to the FPs and constitute a further signal (from the Ministry) that FP participation is being given higher priority.

Danish participants on the Programme Committees indicated that while they introduce suggestions for changes and additions to the work programmes in order to try to strengthen Danish opportunities there are many other people at the table (some programme committees have over 100 members) and so it has become increasingly

difficult to exert a strong influence. It is also pointed out that the Programme Committees are not the only mechanism for influencing the work programmes - Advisory Groups and technology platforms also have a strong influence, so it is not really possible for a single country to be successful in all of the areas they are lobbying for. Strong representation can clearly affect things but researchers have to be realistic about the level of influence that can be achieved.

#### **PARTICIPATION IN CONFERENCES, WORKSHOPS AND OTHER NETWORK ACTIVITIES**

As indicated above, Danish researchers participate actively in conferences, workshops and other network activities at EU and international levels. These activities are aimed at discussion of existing research and development and the planning of future research, and it is not uncommon for the participants to invite relevant Commission officials in order to ensure that they can act as a mechanism for influencing the FPs. Many of these meetings and events are held in Brussels explicitly in order to encourage attendance by the Commission and other EU-level organisations that are based in Brussels.

Many leading FP participants emphasised the importance of ‘socialising’ your research ideas, arguing that the more that you promote ideas within the scientific community, the easier it is to garner support, and thereby influence the Commission’s priorities and plans. It is important to try to become involved in European networks that are strongly linked to the FPs, have high levels of participation, and exert a strong influence on the programmes. For those on the outside, exactly how such networks are formed, how they gain their central position, and how to enter these networks is rather unclear, however.

Feedback from interviewees suggests that the strongest networks are comprised of the leading research groups and companies, and so in order to become part of them you need to have a strong reputation and high profile internationally. Some of the top performing Danish researchers (academic and industrial) stated that, for them,

influencing the FPs and getting involved in projects was relatively easy because of their leading position. By comparison, researchers and companies that have a lower profile internationally will almost always have to work much harder to be recognised and exert any kind of influence. For many it may simply not be possible to have any real influence, but increasing their visibility through conferences and other network activities are seen to be an important potential route through which to do this.

#### **PARTICIPATION ON EUROPEAN TECHNOLOGY PLATFORMS / JOINT TECHNOLOGY INITIATIVES**

Relatively few interviewees had experience of participation in European Technology Platforms (ETPs), Joint Technology Initiatives (JTIs) or other platforms (including Article 169 actions) but those interviewees that have highlighted that these are becoming more important in shaping the EU research agendas, so it is vital that Denmark plays as full a role as possible. It is also suggested that participation on ETPs/JTIs is one of the most effective ways for individual groups to influence the shape of the FPs. Opportunities to influence the work programmes after they have been drafted are limited, and so the best approach is to be able to get your ideas included from the outset. In order to do this, it is important to form strong consortia early and adopt multiple approaches (i.e. all of those discussed above) to try to get the ideas adopted by the Commission.

#### **PARTICIPATION ON OR INPUTS TO FP ADVISORY GROUPS**

The Commission has established a number of expert Advisory Groups that (as the name implies) advise the Commission on its proposals for the Framework Programmes and on its work programmes. While they do not have an ‘official’ role in the same way as the Programme Committees they are perceived to be fairly influential, particularly in the early stages of the development of the FP priorities and individual work programmes. However, they constitute a less open or obvious route through which Danish researchers can exert an influence, and were mentioned far less frequently than the Programme Committees.

## **PARTICIPATION IN CONSULTATIVE PROCESSES / SUBMISSION OF EXPRESSIONS OF INTEREST**

Relatively few of the interviewees highlighted either the formal consultations run by the Commission or the submission of expressions of interest as significant routes by which they influence the FPs.

Some of the leading researchers do, however, have direct routes into the Commission and submit ideas and suggestions directly to Commission officials that are known to have a role in drafting the work programmes. This very direct approach can be highly effective, particularly in the very early stages of the development of work programmes. However, it is important to note that many other research groups and consortia vie for the attention of Commission officials and so it is important to be as helpful as possible and not simply to lobby for your own ideas. Those with the strongest relationships and influence tend to also provide active support to the Commission, by helping to draft strategies, develop action plans and white papers, and so on. They also help to introduce the Commission to key players, and assist them with the assessment and weighing of competing ideas. These interviewees have indicated that their objective has been to become a ‘trusted advisor’ to the Commission officials, and not to act in an entirely self-serving fashion. It is important to get into a mutually beneficial, reciprocal arrangement with the Commission, so that both sides can benefit, rather than to simply pursue your own interests. These commentators stated that it is not easy to get into such a position of influence, but where it can be achieved the benefits can be very significant in terms of influence over the programmes.

Feedback from commentators suggests that any ‘single input’ approach is unlikely to be successful in influencing the programmes, and that it is important to ‘lobby’ as part of a team involving researchers and organisations, preferably from a range of countries. In some sense there needs to be a critical mass of support or weight behind a particular idea or position in order for the Commission to adopt it. The larger countries are con-

sidered to be particularly influential, and for this reason, single responses to consultations or single expressions of interest from Denmark (without wider international support) are not expected to be particularly effective.

## **INTERACTION WITH THE DANISH EU RESEARCH OFFICE (DANRO)**

Many interviewees mentioned the important role played by DANRO in helping them to develop and implement some of the actions described above. The office was set up by DASTI in 2006 with the purpose of assisting Danish researchers and research organisations in relation to the EU’s different research and innovations programmes. The primary responsibilities of the office are to stay informed about the different research activities taking place in the EU, and also to assist possible applicants to the EU’s research programmes through contact with relevant persons from the Commission.

The office provides a link / route into the Commission and supports prospective applicants in promoting their ideas and getting involved in the various network meetings and discussions taking place in Brussels and which can influence the work programmes. They can help to arrange visits and meetings in Brussels on behalf of Danish researchers, and also to assist with contact to Commission staff with special reference to preparation of FP proposals. DANRO is also able to use its contacts to promote certain topics by sharing information with the Commission.

## **PARTICIPATING IN A FP PROJECT**

Perhaps not surprisingly, some researchers have indicated that one of the best routes to influencing the FPs is to be an FP participant. As a complete outsider or newcomer it is very unlikely that you will be able to exert much of an influence, so it is important to get a ‘foot in the door’ first. Participation in an FP project provides the entry route and massively enhances opportunities to influence the work programmes, as you will have already established the kinds of networks and contacts within the Commission that are vital in order to exert an influence. In this sense a

researcher's first FP project is the most important platform from which to build future influence and success.

#### 4.2.3 Areas where more could be done to increase the relevance of the FPs

Questionnaire respondents were asked to describe ways in which Danish actors could do more to influence FP work programme calls. Over 30 suggestions were given relating to possible actions by individual researchers, their research groups or institutions. The most common suggestions were: (i) to participate in conferences, workshops and other network activities, (ii) to input to FP Programme Committees, and (iii) to participate in, or input to expert Advisory Groups. A number of comments to this question also suggested that more information was needed on how individual researchers and organisations might go about influencing the FP.

Respondents to the survey questionnaire were also asked to describe ways in which national agencies and representatives could enhance the extent to which they influence FP planning, in order to increase its relevance to Danish research communities. The most common suggestion put forward by respondents was that greater effort should be put into seeking input and feedback 'bottom-up' (i.e. from scientists, researchers and businesses) and to improving relationships and interaction between national agencies / representatives and these groups. The Reference Group system, introduced in the Spring of 2009 is one such mechanism that has received strong support from the actors involved and which has begun to implement this recommendation.

Other common suggestions for areas where more could be done nationally to increase the relevance of the FP included the following:

- Improve the links between national agencies/ representatives and the Commission and increase lobbying activities in Brussels
- Improve the national coordination of inputs to the FP

- Improve national information provision relating to call texts
- Improve national information provision relating to strategies for influencing FP
- Improve interaction with other countries.

Feedback from interviewees indicates that while the strategies used to influence the programmes are not always effective, it is important to continue to make those efforts.

Denmark is widely perceived (among interviewees) to be failing to meet its full potential as regards FP participation, and most see a need for Denmark to increase its influence on the work programmes in order to increase the relevance of the calls and hence levels of demand. Danish success rates are (correctly) perceived to be good, so the priority is for Denmark to increase demand for participation and for Danish partners to take a more central role in the projects. In order for this to happen, Denmark needs to position itself within strong and effective networks and use these as the basis for increasing its influence over the programmes. This can be difficult to achieve but it is vital that efforts in these directions continue as it is arguably the most potent way in which to occupy a central role in the programmes and realise a high level of return.

Interviewees put forward the following suggestions for increasing the level of influence that Denmark exerts over the FPs, as a means by which to increase the relevance of the FPs to Danish research and industrial communities.

#### IMPROVED LOBBYING THROUGH COLLECTIVE ACTION WITH OTHER MEMBER STATES

Some commentators stated that other countries such as Sweden, Finland and the Netherlands have implemented approaches earlier, more proactively and with greater resources than Denmark, and that this is part of the reason why Denmark's participation has fallen in relative terms from FP4 – FP6. As the number of Member States has grown the number of delegations and consortia lobbying for their own agendas

has increased. Other countries are increasingly aware of the need to lobby strongly and to take an active role in the various forums that can lead to increased opportunities for participation by their communities. Therefore it is not always possible for a small country such as Denmark to exert an influence, particularly in areas where it is not perceived to be in a leading position from an EU perspective. Gathering support from other countries for positions that Denmark wishes to promote is therefore considered to be vital within the lobbying process.

#### **STRENGTHENED INSTITUTIONAL ENCOURAGEMENT / SUPPORT FOR EU-LEVEL NETWORKING**

It has also been pointed out that some Danish institutions are better than others at encouraging their researchers to join EU networks, Advisory Groups, associations and lobby groups that are known to have a strong influence on the programmes, or to broker links with these groups. Some universities are, by their own admission, not very experienced or knowledgeable about how to influence FP priorities (although individuals within these institutions will be). Lack of centralised capability in this area appears to be a barrier to progress in the sense that some institutions are less able than others to promote and support these kinds of actions.

#### **STRENGTHENED REFERENCE GROUP MECHANISM**

It was suggested that the Reference Group mechanism could be strengthened by (i) establishing Reference Groups in all areas of the programme, and not just the seven areas covered currently, and (ii) improving the operations of the reference group by making it clearer to participants how their inputs are converted into a position that is taken forward to the Programme Committees. Members provide inputs that are collected together by the Ministry officials, but the members of the group do not see the resulting 'output' or position adopted by the Ministry based on those inputs. As such inputs disappear into something of a 'black hole' and members of the Groups have

to wait to see the calls to determine whether their inputs have been effective. In cases where there is little or no evidence of the requested changes being taken forward by the Commission, it is often unclear whether this is due to a failure on the part of the Danish delegation to argue the point or a failure of the Commission to adopt it. In order to retain the interest of the Group members it is important to provide clear assurance and evidence that their inputs are being taken forward.

It is clear from the feedback received through the survey that many FP participants from Denmark are not aware that the Reference Groups have been established. There are also many participants that wish to provide inputs into the Programme Committees but currently have no mechanism to do this. There are accordingly some opportunities to strengthen the Reference Group mechanism and ensure that all Danish research groups that wish to contribute are given an opportunity to do so.

Some interviewees also informed us that Commission officers have told them that the most effective way to influence the work programmes is through pressure applied by the ministries. While there is a lot of scientists lobbying for certain positions, ministerial officials in some respects carry more weight, especially if those officials have a strong scientific background or knowledge sufficient to argue strongly for specific scientific topics. For this reason it is vital that Danish ministries strengthen their inputs and improve the extent to which a coordinated national approach can be adopted.

#### **IMPROVED STRATEGIES FOR DANISH PARTICIPATION ON EU-LEVEL STRATEGIC FORUMS**

Feedback from interviewees suggests that it is important for the leading Danish companies and scientists to be in key positions (on ETPs/JTIs and Advisory Groups) and efforts should be made to determine the extent to which they are, and to assist their involvement wherever possible. We do not have data on levels of participation on these forums, and it is not clear that anyone within the

Danish system has this information either. As such there is scope for a more strategic approach to Danish participation on these mechanisms and platforms and better oversight of the extent to which Denmark is achieving its full potential within them. This should form part of a wider strategy to identify and document, in a more concerted way, the key industrial players and research groups and ensure that they are actively involved and are well positioned in all of the influencing mechanisms linked to the FPs.

#### **STRENGTHENED COORDINATION OF INPUTS BY DANISH MINISTRIES**

Some interviewees highlighted that the level of Danish influence has been weakened following changes at the level of the FPs that have not been mirrored by changes in the ways that Danish ministries have approached negotiations and inputs to the programming of future FP directions and priorities. Under FP7 various sectoral research components, both scientific and policy-related, that used to be managed directly by sectoral Directorate Generals (DGs) have been transferred to DG Research, with a corresponding transfer of budget lines. At the same time the reorganisation of the university system in Denmark has meant that some Danish sectoral research institutes have now been incorporated into the university system, with a corresponding shift in national funding and support away from the sectoral ministries to the Ministry of Science, Technology and Innovation. In some cases it has been argued that the changes introduced in FP7 have led to significant changes in how priorities are developed, with greater cross-coordination of research priorities at Commission level, shifts in the balance of expenditure, more joint programming, and so on. It is claimed that some of the changes at EU-level have not been matched by strong cross-coordination and planning by Danish ministries, and this has led to a weakening of Denmark's influence over the programmes and a corresponding reduction in the number of projects and volume of funding coming from Europe. There are also concerns that there may

be a further weakening of Denmark's influence and returns unless the Danish ministries can work more closely together to assess the implications of changes to EU-level research planning and funding arrangements, and work together to ensure that all opportunities to maintain or enhance Denmark's role are fully exploited. This is a complex set of issues that requires further investigation.

### **4.3 Strategies for increasing demand for FP participation**

#### **4.3.1 Existing levels of demand**

In Section 3 we presented data to show that Denmark's overall level of FP participation is at historically low levels and that its relative share of FP6 funding is lower than that of its comparator countries on a number of measures. However, we have also shown that success rates for FP6 proposals with Danish involvement were high compared to the FP6 average (30 per cent higher) and that Denmark has experienced above average proposal success rates in most of the FP6 Priority Areas. The combination of these two factors (high success rates and low participation rates) would suggest that Denmark has very low levels of demand for participation, overall and in specific areas of the programme. To investigate this issue of 'low demand' for FP participation further, we have calculated levels of demand within each FP6 Priority Area from the available data on proposal success rates and participation rates.

The first two columns of Figure 14 below present data on Danish participation rates and Danish proposal success rates (respectively) for each FP6 Priority Area. Each cell indicates whether Denmark's share of FP6 participations and its success rates are 'very low', 'low', 'average', 'high' or 'very high' based on a comparison with FP6 averages for that Priority Area. The final column presents the (deduced) level of Danish demand for participation in each area, with the percentages being calculated by dividing the Danish participation ratio by the Danish success ratio.

Given that levels of Danish participation in the FPs (and to a large extent the volume of FP funding received) is determined by a combination of demand (proposals submitted) and success rates, low or very low designations for demand or success may help to indicate where any future action might be focused. Greater levels of support and encouragement to participate may be necessary in areas of low or very low demand.

The results presented in Figure 14 confirm that, at an aggregate level, a combination of high success rates and low levels of demand drive Denmark’s overall level of participation in FP6. We can also see from Figure 14 that in the Priority Areas where Danish participation rates were high, success rates were also high, so in most cases Denmark’s ‘strong’ performance in these areas is driven by ‘above average’ success in the competition rather than as a result of high levels of demand. In fact there is only one Priority Area where, based on this analysis, demand levels can be considered to be high (Food quality and safety). In this area a combination of high levels

of demand and high success rates have combined to give a ‘very high’ level of participation. This is obviously the ‘ideal’ scenario for any individual Priority Area.

In most Priority Areas we find that high (or very high) success rates are ‘boosting’ Denmark’s participation rates, and that therefore in most Priority Areas the calculated level of demand was found to be low (or very low). If we also consider that Denmark’s overall level of participation in FP6 was lower than might have been hoped for (and lower than had been achieved in FP5), it is not difficult to conclude that the most pressing challenge facing Denmark is to seek to increase its participation in proposals submitted to the FPs.

Putting this challenge into context, if Denmark were to have achieved the same share of participations in FP6 as it did in FP5 (i.e. 2.6 per cent) it would have had to participate in at least an additional 1,270 FP6 proposals (i.e. 27 per cent more) based on its achieved success rates.

**Figure 14 – Levels of Danish demand, based on a comparison of Denmark’s relative success rates and participation rates in FP6**

Priority	Danish participation ratio (PR) (Ratio of Danish to FP6 participation rates)	Danish proposal success ratio (SR) (Ratio of Danish to FP6 success rates)	Implied demand (PR/SR)
1. Life sciences, genomics & biotechnology	High (135%)	High (134%)	Average (101%)
2. Information society technologies	Very Low (63%)	High (130%)	Very Low (49%)
3. Nanotechnologies and nanosciences	Low (83%)	High (117%)	Very Low (70%)
4. Aeronautics and space	Very Low (30%)	High (130%)	Very Low (23%)
5. Food quality and safety	Very High (195%)	High (151%)	High (129%)
6. Sustainable development	High (136%)	High (150%)	Average (91%)
7. Citizens and governance	Average (102%)	High (119%)	Low (86%)
Policy support/S&T needs	High (155%)	Very High (176%)	Low (88%)
Horizontal research activities – SMEs	Average (102%)	High (133%)	Low (76%)
Support for international cooperation	Very Low (52%)	Very High (185%)	Very Low (28%)
Research and innovation	Low (81%)	Low (84%)	Average (96%)
Human resources and mobility	Average (92%)	Average (90%)	Average (102%)
Research infrastructures	Very Low (54%)	Average (102%)	Very Low (53%)
Science and society	High (133%)	Very High (161%)	Low (82%)
Support for the coordination of activities	High (143%)	Very High (184%)	Low (78%)
Development of R & I policies	Very Low (54%)	Very Low (67%)	Low (80%)
Euratom	Very Low (34%)	Very High (190%)	Very Low (18%)
<b>Total</b>	<b>(100%)</b>	<b>(130%)</b>	<b>Low (77%)</b>

Source: FP6 participation data (E-CORDA, September 2009) and FP6 proposal data (E-CORDA, September 2009)

### 4.3.2 Why is demand for participation low?

Our discussions with Danish actors connected to the FPs have highlighted a number of factors that have contributed to the overall decline in FP participation, and the reasons behind what we consider to be low and falling levels of demand.

#### THE INFLUENCE OF NATIONAL FUNDING

National funding is felt to have played a significant part in the downward trend in FP participation levels over the last decade. Interviewees have indicated that during the 1990s Danish investment in research was relatively low and so researchers looked to international funding programmes, principally the FPs, to support their research. During FP4 and FP5 Danish participation levels were high and national performance within the programmes was strong. However, national funding has increased over the past decade, and this has reduced the necessity for FP participation. In addition, national funding was assigned in larger volumes, for longer periods and under easier terms than it had been previously, while at the same time competition for FP funding increased and the terms and conditions (and administrative complexity) of the FPs worsened. These are felt to have been significant explanatory factors for the fall in FP participation over recent years.

#### THE COMPLEXITY AND ADMINISTRATIVE BURDEN ASSOCIATED WITH FP PARTICIPATION

A further possible reason behind the decline in FP participation and a lack of demand concerns the high administrative burden and complexity associated with FP participation, both in terms of applying for and in managing and administering the projects. We received mixed feedback as to whether the FPs have become better or worse in this respect, with some commentators stating that the situation has become better over successive programmes and others stating it has become worse. Certainly some elements of the FPs have improved (e.g. the electronic submission procedure) but there has also been significant ‘outsourcing’ of management responsibility by the Commission so that under recent programmes the consortia (and the project coordinators in particular) have a far higher administrative and repor-

ting burden than used to be the case. Overall, administrative burdens and complexity associated with FP participation were more commonly thought to have increased and that often any improvements have been more than counteracted by higher administrative and reporting burdens.

Part of the perceived increase in administrative complexity is also associated with the drive from the Commission, under FP6, to create Instruments that involved larger consortia in larger projects, and this has also been a factor for some in reducing their willingness to take part in FP projects. For some commentators these structures were simply too big and too complex to manage, and this may also have led to a decline in demand for participation.

We also encountered a fairly universal view that the FPs are simply too complex for the majority of SMEs to cope with, even when they are only acting as partners in projects and do not have responsibility for coordination. The barriers in terms of the complexity of the rules and administrative requirements, the burden of reporting, and the language and terminology that describe the requirements, represents a significant barrier to entry for small businesses. Again it is unclear whether this situation has become better or worse over successive FPs but most commentators agree that it is an issue that has to be addressed if demand for participation among SMEs is to increase, and if they are to occupy a stronger role within the programme.

#### LOW SUCCESS RATES WHEN APPLYING TO THE FPS

Although something of a misperception based on the data available, the success rates when applying to the FPs are often considered to be very low, which acts as a further disincentive to many researchers and companies when considering whether or not to apply. If national programmes provide funding on better terms (i.e. easier to access/higher success rates) then the FPs will be seen to offer poorer terms. So, while the success rates achieved by Denmark within the FPs appear to be high, there is still a perception that the FP

competitions represent a lot of work and offer only a small chance of obtaining a small amount of funding, at least in comparison to alternative (predominantly national) funding mechanisms.

#### THE SPECIFICITY OF FP CALLS

As discussed above, many commentators have indicated that the FP calls are often very specific, describing both what should be done and what should be achieved at a level of detail that is highly prescriptive and leaves little room for researchers' own ideas. This can act as a disincentive to many prospective participants, particularly if the topics included under the calls are not well aligned to their own ideas and the projects that they would like to undertake. It is therefore felt that many potential applicants have chosen not to apply because they found the opportunities to be too limited or restrictive.

There is clearly a balance to be struck between very open calls for proposals which are likely to present lots of opportunities for researchers but which will (accordingly) result in high levels of demand and hence relatively low proposal success rates, and the more prescriptive approach which limits opportunities and as a result, diminishes demand and keeps success rates relatively high. There is no easy answer to getting the balance right at the level of the FPs, and from a Danish perspective the more important issue is arguably that national funding offers both more freedom as to the research project ideas that can be supported and higher success rates than the FPs.

#### LACK OF PRIORITISATION OF, AND SUPPORT FOR, FP PARTICIPATION

A further reason for the decline in Danish participation levels over the past decade has been a lack of prioritisation (nationally) of FP involvement and a lack of strong national and institutional support measures to facilitate involvement. It has been suggested that other countries developed their support systems earlier and have done a better job of linking their national and institutional policies to EU priorities. Other countries have also provided stronger incentives for participation and

provided more active support, building up larger support units with better capabilities.

While Denmark has done much to improve its support for FP participation in the last 2-3 years, as we will go on to explain, it has been too late to halt the decline in Denmark's relative participation. It is also arguably too early to have seen a reversal in fortunes as a result of the recent measures to strengthen participation, though many interviewees believe that over the course of FP7 the renewed emphasis and the strengthened support measures will lead to an upturn in FP participation.<sup>7</sup>

#### THE HIGH COST OF DANISH RESEARCH

There is another side to the Danish research landscape that may be suppressing FP participation levels - the high cost of doing research in Denmark in comparison with other countries. Demand for FP participation can obviously be driven from inside the country, but many opportunities for participation will come from consortia in other EU countries looking for Danish partners. The high cost of Danish research was cited by some as a competitive disadvantage, and one that may limit levels of external demand. This is not a problem that is easily addressed but it may form part of the reason why Danish participation levels have been falling over the last decade.

#### OTHER FACTORS LIMITING DEMAND FOR FP PARTICIPATION

It is likely that there is a range of other factors that limit in some way the propensity of Danish researchers to apply to the FPs, but we believe we have captured the main ones above. The size of the Danish research communities that could potentially participate in the different areas of the FPs is not known, and it is likely that the different levels of demand in each will reflect at least to some extent differences in the size of the Danish research communities that *could* participate.

It is also clear that not all researchers and research-active companies will choose to try to participate in the FPs, and not all of those that

7) There is some evidence that the improved prioritisation and support for FP participation may already be starting to have an effect. The Danish EuroCenter has reported that the share of funding obtained from FP7 has been boosted by high levels of success under recent calls (not covered by our own analyses), and that Denmark's funding share is now above the level achieved in FP6. This is a very positive result, particularly if it can be maintained across the remainder of FP7.

apply will be successful. There are many specific reasons as to why past participants may elect not to do so again, and there are many specific reasons that might cause non-participants to ultimately decide that they do not wish to seek to participate. However, by providing good levels of very active support to prospective applicants and participants it is possible for support providers to identify common problems and barriers and to find ways to address these. This has begun to happen and there are reasons to feel confident that many barriers to participation are already being squarely addressed. As the support functions develop, and as their availability becomes more widely known and appreciated, it is likely that barriers to participation can be removed or alleviated and that the benefits of participation can be more wisely recognised and valued.

#### 4.3.3 Motives and key drivers for Danish participation in FP projects

Demand for participation in the FPs relates to the extent to which it offers to satisfy one or more objectives of the participants. We have therefore looked at the motives of participants when choosing to become involved in FP projects.

##### 4.3.3.1 Motives for Danish participation in FP projects

Questionnaire respondents were asked to rate 15 given factors in terms of their importance as

motives for their organisation or research group's participation in FP projects. Based on responses to this question, the primary motives for FP participation (i.e. those most commonly rated as 'important'/'very important') are (i) to access research funding, (ii) to develop new or improved tools, methods or techniques, and (iii) to develop new or improved relationships or networks. All seven factors rated as 'important' or 'very important' by at least half of respondents are shown in Figure 15 below. It is important to note that the other factors, while less commonly regarded as of high importance overall, were all considered as 'very important' by at least some of the participants responding to the survey.

Comparisons between the responses of different organisation and participant types show a good degree of alignment as to the most important motives for participation. However, there are a small number of important differences between groups. In particular, respondents from higher education and public research organisations more commonly considered the following three factors as important motives, compared with respondents from industry and private research organisations:

- Addressing specific scientific or technical questions, problems or issues
- Providing training
- Facilitating the mobility of researchers

Figure 15 – Primary motives for involvement in FP projects (n=265)

	Of little or no importance	Moderately important	Important or very important
To access research funding	5%	10%	84%
To develop new or improved relationships or networks	5%	19%	76%
To develop and extend internal knowledge and capabilities	10%	18%	72%
To develop new or improved tools, methods or techniques	9%	19%	72%
To address specific scientific or technical questions, problems or issues	14%	18%	68%
To tackle problems that have a European/international dimension	21%	23%	55%
To access capabilities that do not exist in Denmark	16%	29%	55%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

While respondents from industry and private research organisations more commonly considered *the development of new or improved commercial products and services* as important, compared with higher education and public research organisations.

Survey respondents were also asked to indicate which of these motives were the three most important drivers for their participation in FP projects (in order of importance). Figure 16 shows the four factors rated as a ‘top 3 driver’ by at least one quarter of respondents, as well as the proportion of respondents rating each as the 1st, 2nd and 3rd most important driver for their participation. As can be seen, the responses largely confirmed the picture shown above, with the top four key drivers here all appearing in the top five most important motives in Figure 15.

However, there were some differences in the outcome when participants were only permitted to identify three items from the list. In particular, *to develop new or improved commercial products or services* appears to be a much more important driver by this measure, suggesting that it is a highly important driver for a minority. At the same time, *to develop new or improved tools, methods or techniques*, and *to access capabilities that do not exist in Denmark* both appear to be considerably less important drivers by this measure, suggesting that these are ‘somewhat’ important drivers for the many.

Interviewees confirmed these findings, stating that academic research groups are usually most interested in securing research funding, strengthening their networks, and increasing their profile. Industrial partners, particularly the smaller ones, typically look for new technological developments or solutions to specific problems. However, many companies, particularly the larger ones are increasingly adopting a more open (but strategic) approach to innovation, looking to broaden their networks and identify new capabilities and opportunities rather than to work on specific technological issues. Rising costs are also driving some companies to seek to leverage FP funding in order to support elements of their research portfolio. As a result there is usually a good alignment between what the FPs have to offer and both academic and industrial objectives.

Figure 16 – Primary drivers for involvement in FP projects (n=263)

	Selected as a key driver	1 <sup>st</sup>	2 <sup>nd</sup>	3 <sup>rd</sup>
		most important		
To access research funding	67%	47%	13%	8%
To develop new or improved relationships or networks	53%	16%	19%	17%
To develop and extend internal knowledge and capabilities	30%	6%	14%	10%
To address specific scientific or technical questions, problems or issues	25%	8%	9%	9%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

#### 4.3.4 Encouragement for Danish participation in FP projects

The study has explored the extent to which Danish participation in the FPs is encouraged by Danish organisations and by national agencies, and the extent to which incentives are in place that encourage or otherwise facilitate involvement in the programmes.

Questionnaire respondents were asked to indicate the extent to which FP participation is encouraged by their own organisation, by assessing the extent to which they agreed with five specific statements. The results are summarised in Figure 17, which presents (i) the proportion agreeing, and (ii) the proportion disagreeing with each statement. The table is sorted by the ‘net balance’ of responses (i - ii), so that the most prevalent forms of encouragement appear first. More than three-quarters of the respondents agreed that applying for FP funding is encouraged by their organisation. More than half also agreed that FP participation forms an important part of their organisation’s strategy and that their organisation provides active support or assistance with applications. There was less agreement with the other two statements, relating to specific incentives to participate and prestige or status for those who secure funding. Comparing the ‘net balance’ of responses for different types of organisations suggests that there is generally less encouragement for participants in industry and private research organisations in relation to each of the areas mentioned than there is for participants in higher education and public research organisations.

Most universities reported that there are no documented strategies at an organisational level relating specifically to FP participation. Many have set targets for external funding, but the FPs are in most cases not identified separately within strategic documents or funding targets. In most cases no targets for increasing FP participation have been set, but some central support offices within the universities have informal targets that they are working towards, overall and within specific Priority Areas or Instruments of FP7. Despite a lack of formally documented strategies and targets relating to FP involvement specifically it is very clear that all of the Danish universities are affording increased priority to FP participation and all have the ambition to increase the volume of FP funding won and to strengthen and deepen their involvement. There are increased levels of support available at institutional level and a range of incentives (described below) that are intended to increase demand and participation and to assist researchers in negotiating their way through the FPs. The strategies to encourage involvement in the FPs are strongly aligned to institutional strategies to increase their ‘international profiles’ and to become increasingly competitive on the international stage. Strategies relating to the FPs are also aligned to institutional strategies to secure increased levels of income from a wider range of funding sources.

A significant driver for the increased priority given to the FPs at institutional level, particularly within the universities, has been the increased signals and incentives coming from the Ministry of Science, Technology and Innovation relating

**Figure 17 – Encouragement for FP participation within organisations**

	Agree	Disagree
FP participation forms an important part of the strategy of my organisation	79%	7%
Applying for FP funding is something my organisation encourages	61%	18%
Applying for FP funding is something my organisation provides active support/assistance with	57%	20%
My organisation gives prestige and status to employees who are successful at securing FP funding	40%	25%
My organisation provides incentives to encourage FP participation	37%	34%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

to FP participation. The universities and research institutes have been left under no illusion that FP participation should be prioritised and that the Ministry considers it to be an important element in the strengthening of national research and innovation system as a whole. A range of financial incentives have been introduced by the Ministry over the past 2-3 years that encourage, assist and reward FP participation and the Ministry has also strengthened the Danish EuroCenter by bringing it back inside the Ministry and by increasing its level of staffing and resources. The EuroCenter operates as the main national provider of assistance to companies wishing to participate in the FPs. The EuroCenter also plays an active role in working with all prospective FP participants, public and private.

#### 4.3.5 Strategies for increasing demand for FP participation

##### 4.3.5.1 Institutional strategies for increasing demand for FP participation

Questionnaire respondents were asked to indicate which forms of assistance (offered to increase demand for FP participation) their organisation or research group had accessed. The responses indicate that

- Most participants are provided with information on calls for proposals and some are provided with access to draft work programmes or early notification of calls. In this sense the community is being kept well informed about opportunities to respond to calls
- Only a minority of respondents indicated that they receive funding from their own organisation as an incentive for, or to assist with, FP participation

Respondents to the survey described a range of other measures undertaken by their organisation or research group to encourage participation in the FPs. The most commonly mentioned mechanisms were as follows:

- Greater emphasis on the importance of participation, with strong signals being sent to research groups that this is something they should be doing

- Provision of a dedicated support unit to provide information on the FPs and to provide support and assistance with proposal preparation and project administration / management
- Provision of formal training and information relating to FP funding, rules, procedures, support, strategies for success, etc., usually offered by the central unit responsible for supporting FP participation
- Financial support to assist with the development of proposals and with the management of projects
- Support for attendance at conferences and meetings organised by the Commission in order to facilitate dialogue with scientific officers
- Support for networking and communication with potential partners and experienced participants.

Where respondents to the survey questionnaire had accessed assistance offered to increase demand for FP participation, they were also asked to indicate their level of satisfaction with this assistance. The results suggest generally high levels of satisfaction with each form of assistance provided, with over half of 'users' reporting satisfaction (satisfied + very satisfied).

Our programme of interviews allowed us to build up a much fuller picture of the range of actions being taken at an institutional level to increase demand for, or otherwise assist with, FP participation. Some of the measures are not explicitly or directly aimed at increasing demand for participation but they all in some way address the identified barriers to participation discussed above, and as such they are all designed to make the process of FP participation easier and more rewarding for participants. They can therefore all be viewed as mechanisms or strategies designed to enhance the propensity and willingness of researchers to get involved in the FPs.

#### INTRODUCTION AND / OR STRENGTHENING OF DEDICATED CENTRAL SUPPORT UNITS

All of the universities have established or otherwise strengthened their dedicated central support units (CSOs) and enhanced the range of roles and functions that they perform. The universities are building up larger central support functions, are

increasing their staff numbers and capabilities, and are increasing the range and level of support being provided to research groups and individuals.

Some of the units are focused solely on providing support in relation to the FPs while others provide support for a wider set of activities (e.g. all EU or international funding programmes). In some cases the units dealing with FP support cover all aspects of FP support provision, while in other cases other administrative units within the universities handle contractual or legal or financial elements. There are very significant differences between the universities as to the extent of the role assigned to the CSOs and the extent to which there are other administrative units also providing support. In some cases individual researchers continue to access administrative support for FP participation at the department or faculty or institute level, but there is a strong trend towards concentration of FP support within the dedicated, central units.

Many of the CSOs are seeking to improve the coordination of advice and assistance inside the universities, by clarifying roles and responsibilities and ensuring that 'local' support functions can draw fully on the expertise being built up centrally. In some cases this has included the setting up of an internal network at the department level to act as intermediaries, and to ensure that everyone knows what support is available and where to go to access it. There are real efforts underway in some cases to ensure that the internal support is well coordinated, while in other cases there seems to still be some way to go before there is a coherent structure to FP support provision at an institutional level.

#### **PROMOTION OF OPPORTUNITIES**

All of the dedicated units managing FP support are focused on promoting FP participation and all play a role in informing research groups about the opportunities available through the FPs. Most use some kind of website or intranet to deliver information on upcoming and open calls for proposals, and also provide written advice on applying, and information on what the CSOs can do to help.

Some of the units are matching specific opportunities to specific groups and providing additional alerts or getting involved in bilateral discussions to promote these opportunities, but most advertise the information they get through a general broadcast function.

The promotion of opportunities for FP participation is mostly an internal function, with information being provided to prospective applicants inside the institution. A small number of the CSOs have also begun to promote their research groups as prospective partners to other research groups across the EU. These units participate in international events, try to advertise areas of core expertise and increase awareness outside Denmark of the capabilities of Danish researchers. This is currently the exception rather than the rule – in most cases other units support external relationships or these are left at researcher-level.

#### **PROVISION OF INCENTIVES AND REWARDS FOR PARTICIPATION**

Most of the universities now provide clear signals to their research groups that FP participation is encouraged and supported, and many also provide specific incentives and rewards in the form of enhanced career paths, increased recognition, or funding to assist or reward participation.

Many of the universities offer some form of additional financial assistance to researchers applying for FP funding and who might not, for whatever reason, be able to access the financial measures provided by the Ministry or the Research Councils (discussed below). Most of these forms of internal support help researchers to develop ideas for proposals, form consortia, or apply for funding. Some universities offer additional funding for FP project coordinators specifically.

One Danish university provides direct financial rewards to researchers and groups that are successful in winning FP funding, by passing on the money received from the Ministry under the REWARD funding stream. Most others use the REWARD funding to strengthen their CSOs and/or use it to fund additional institutional level

financial support to complement those available directly from the Ministry or Research Councils.

Some of the universities offer ‘career’ based incentives for FP participation, particularly to coordinators of major FP projects or to winners of European Research Council (ERC) grants, the latter of which are considered to be highly prestigious and a strong indicator of international ‘excellence’ and as such are being targeted by many of the institutions. The creation of tenured positions, professorships, expansion of research groups and the creation of new PhD studentships are in some cases offered to researchers as incentives for ERC awards.

#### **DEDICATED ASSISTANCE FOR FP PROPOSAL DEVELOPMENT**

All of the central FP support units within the universities offer a range of support to assist in the proposal development process, both on a one-to-one basis and through written advice and guidance and in some cases training courses.

The support typically includes advice on ideas for research proposals (screening), reviewing and commenting on draft proposals, and more dedicated assistance with drafting the management, administrative and financial elements of the proposals. This assistance is offered to all FP applicants but the most active support is assigned to researchers that are coordinating proposals and have the primary responsibility for developing the offer. A key role of the inputs of the CSOs is to ensure that all of the rules and requirements associated with applications have been complied with, and all seek to undertake ‘compliance checks’ to ensure that all parts of the proposals are fully completed in line with the Commission’s guidance.

Some CSOs have developed templates and associated guidance to help researchers to develop strong proposals and some offer training sessions, using examples of successful proposals to coach applicants on what to do. The support units also help to advise on typical reasons for failure, re-

viewing successful and unsuccessful proposals in order to develop their own understanding.

Many CSO staff have scientific backgrounds and so can help with more than just the administrative aspects of a proposal, commenting on style, language, coherence, and so on. Several of the CSO staff also have direct experience of FP participation, and some have acted as experts evaluating FP proposals, so they tend to have a good knowledge of how to assist with the development of strong proposals. Many provide dedicated assistance in relation to the ‘impact’ section of the proposal as this is felt to be a key section that many researchers are unsure of how to complete well.

#### **DEDICATED ASSISTANCE IN RELATION TO MANAGEMENT OF FP CONTRACTS**

Most of the universities are at present trying to increase the extent to which their researchers coordinate FP projects. The demands placed on FP project coordinators are considerable but most universities believe that the benefits of occupying a central role within FP projects (control, profile, reputation, follow-on funding) outweigh the costs, and all are pushing hard to increase the number of projects coordinated by their researchers. In order to facilitate this and increase the willingness of researchers to take on this role, the CSOs have developed a range of incentives and direct support measures, most of which are designed to reduce the administrative burden associated with the management and administration of FP projects. However, the universities do not encourage inexperienced researchers to act in a coordinator role – new entrants are advised to act as partners first and move on to become work package leaders and project coordinators only when they have built up sufficient experience of FP participation.

The direct support offered in relation to the management and administration of FP contracts covers most if not all of the ‘non-scientific’ components, from contract negotiations, consortium agreements, Intellectual Property Rights (IPR) and other legal issues, financial planning and

reporting, contract amendments, auditing, and so on. The administrative and reporting burden and the number of rules and stipulations that have to be followed within FP projects are considerable, and the aim of the FP support units are to remove as much of that burden as possible. In many cases the more specialised elements (legal, IPR, etc.) are handled by other dedicated functions inside the universities, but the CSOs in most cases are taking on an increased range of functions themselves.

It is now becoming common for the FP support units to help to cover their own costs by ensuring that some element of the project funding for management and administration (which can be claimed from the EC at 100 per cent) is allocated to the support unit. In this way the units can afford to relieve the researchers of the financial and administrative management and reporting and can build up their capacity and capabilities and ensure that they can continue to provide specialist, high quality assistance to the projects on an ongoing basis.

#### **4.3.5.2 National strategies to enhance demand for FP participation**

Interviewees confirmed that the Ministry has been sending very strong signals to the research community over the past 2-3 years, making it crystal clear that FP participation and international collaboration should be pursued, recognised and rewarded. A number of measures have been introduced as part of a Ministry strategy to enhance FP participation and to halt and reverse the downward trend in Danish participation.

The Ministry has put a number of financial incentives and supports in place, including:

- The REWARD funding line – top-up funding to encourage and reward directly FP participation. Approximately DKK 65m per annum is set aside each year and allocated to the universities in proportion to the volume of FP funding they achieved in the previous year
- START grants – additional funding to support proposal development where the Danish partner

is in the role of coordinator. START grants are administered by the Research Councils. The amount of funding available appears to vary (reported to be DKK 50k – 200k), and we were informed that one Research Council no longer offers this grant, something that has attracted widespread criticism among the research communities

- Exploratory grants for SMEs – up to DKK 120k to help proposal preparation, although the money is only awarded if the proposal is actually submitted
- Additional financial support for coordinators for contract negotiations (following a positive decision)
- Additional funding for the creation of Danish networks working towards bigger EU proposals and the development of strategies for enhancing their FP participation
- Additional funding from the Ministry to create international networks (described by some of mini technology platform type initiatives).

The Ministry has also taken a number of steps to strengthen the role and operations of the Danish EuroCenter over the past couple of years. The first and arguably most important change has been to bring the EuroCenter function back inside the Ministry (previously it had been outsourced). This change, introduced at the beginning of FP7, is widely regarded to be a better arrangement as it brings the main national support provider closer to the political centre, improving interaction with Ministry officials. The EuroCenter has also been strengthened, with double the number of staff (now 14 people) and more resources with which to operate.

The objective of the EuroCenter is to provide high quality assistance in relation to all aspects of FP participation, in order to increase the participation of Danish actors and enhance the benefits they derive. It employs the National Contact Points who act as the knowledge hubs and key points of contact for each Priority Area of the FP. Its activities include:

- Promotion of the benefits of international collaboration and networking, encouraging participation in the FPs based on the positive benefits that it brings rather than as simply a funding opportunity. The EuroCenter also seeks to clear up misunderstandings and confusion about the FPs and address negative attitudes towards participation
- Active support to participants, particularly industry, before, during and after the application process. The EuroCenter is the main support provider here and several measures are in place to encourage and assist industrial participation. For example, the EuroCenter contacts non-participating companies to raise awareness of the FPs and encourage participation. The EuroCenter also offers one-to-one advice at any stage of the process and designs and delivers a range of training courses about the FPs
- Working closely with the university CSOs in order to strengthen their operations and transfer knowledge about the FPs into the university system. The EuroCenter will also support individual researchers but increasingly works through the CSOs in order to strengthen their operations and to ensure a better division of labour
- Collection and analysis of statistics from E-CORDA to assess how Denmark is doing. The EuroCenter prepares progress reports on a regular basis and develops strategic proposals on how and where Denmark can improve its participation in defined focus areas
- Participation in the FP Programme Committees, and management of the newly established Reference Group function.

#### 4.3.6 Satisfaction with support provision

We received extremely positive feedback for the support that is now available in Denmark for FP participants, at both institutional and national levels.

University participants spoke very highly of the assistance available from their CSOs, stating that there is a very good array of support on offer with very few gaps in provision. The individuals working in the support functions were described

as highly experienced, knowledgeable, responsive and approachable individuals who always do their best to answer questions and provide active advice, guidance and hands-on assistance in relation to all areas of FP participation. Among those that access the support, it is clear that the support providers are having a very positive impact in improving the willingness of people to participate and in enhancing their approaches to participation. Project coordinators in particular value the opportunity to hand significant elements of the financial and administrative set-up, management and reporting across to the CSOs, freeing them up to focus on the research. This is clearly helping to reduce the negative perception that acting in the role of coordinator carries too high an administrative burden to be worth it.

The CSOs are rightly proud of the achievements they have made, although only a few are currently able to ‘measure’ quantitatively the impact of the assistance that they provide in helping to enhance demand for participation within their institutions. This is because most universities still permit researchers to develop and submit proposals without reference to the CSO or FP support office. As such, there is no central overview within these institutions of how many proposals are being submitted and from where, meaning that it is not possible for these CSOs to understand demand levels or to calculate accurately university success rates.

We also received very positive feedback about the measures implemented by the Ministry of Science, Technology and Innovation to encourage, incentivise and support FP participation. The financial measures have been very welcome, as has the strengthening of the EuroCenter and the decision to bring it back inside the Ministry. Signals and incentives are very necessary within what is currently a positive national funding environment, where the FPs are seen to offer lower volumes of funding and on less favourable terms.

We also received very positive feedback for the EuroCenter, both for the range of support on offer and the quality of the assistance available. The National Contact Points (NCPs) have a good level

of knowledge and experience, are responsive and helpful, and provide excellent support to all parts of the community. The focus of the EuroCenter (from a user perspective) is very much on the practicalities, and beneficiaries of the support feel that the advice given is very useful and of a high quality. It is also often stated that both the EuroCenter and DANRO have ‘inside information’ that is not available from elsewhere and which helps applicants to improve their tactics when applying to the FPs.

#### 4.3.7 Suggested actions to increase demand for participation in the FPs

Respondents to the survey questionnaire were asked to describe any ways in which national or institutional support for prospective FP applicants could be improved. A large number of suggestions were provided, which can be summarised into the following five main areas:

- Influencing the FP - Greater centralised efforts to influence the FP and greater encouragement and support for individuals and organisations to take action to influence the FP
- Information provision – Providing early information on FP calls and formal information and guidance on FP applications
- Financial support – Offering increased funding to support FP applications and projects and providing rewards, incentives and status to successful FP applicants
- Application support – Establishing or strengthening dedicated support for the administration of FP applications
- Networking – Providing and supporting networking and collaboration building activities.

It is worth noting that almost all of the suggestions put forward are already in place, so it would appear that there is a need to increase awareness of existing support measures, and extend their reach so that all Danish actors have access to these forms of support. This should help to improve take-up of the available support and persuade increased numbers of Danish researchers and companies to apply to the programmes. Interviewees were more aware of the full range

of support measures and incentives that are currently in place, and few suggestions for entirely new measures were put forward. However, many interviewees also argued that more could be done to strengthen existing measures and to enhance awareness and take-up. The main recommendations put forward are summarised below.

#### IMPROVED INCENTIVES FOR FP PARTICIPATION

While we received almost universal support for the various incentive measures that have been put in place over the past few years to boost FP participation, some commentators argue that they are not enough to overcome the significant barriers to FP participation. By some distance the most significant barrier to increased demand for FP involvement is the positive national funding environment and the fact that FP funding is offered in smaller volumes, is in some cases more restrictive, and tends to carry a higher burden in terms of ease of access and ease of use.

It has been reported to us that core funding to the Danish universities is reducing. Based on data supplied by DASTI this is not strictly correct, although it may be reducing for some in relation to non-core grants. However, we are aware that nationally there are moves to increase the share of income that is won competitively, whether that be from the Research Councils, from industry and charitable organisations, or from international research funding mechanisms such as the FPs. These moves are likely, over time, to help to increase demand for FP participation in Denmark but there was no real sense from our investigations that researchers are yet facing real pressures to become more international in their outlook. While this is strongly encouraged by the Ministry and most of the universities, the drivers to do so are still relatively weak.

Some of the research institutes also stated that there is a limit to FP participation levels, not because of limited opportunities but due to limited support from funding agencies to help research groups find their share of the project funding. So, while the Ministry is sending all

the right signals about FP participation, it is still the case that national funding is not sufficiently geared towards helping those who are successful in winning FP funding. A small number of interviewees also stated that they do not feel that their Research Council recognises or rewards FP participation, at least not to the same extent as the ministries do. The Research Councils are in some cases described as being too national in their outlook and attitudes, and not particularly active in international fora and programmes. This means that they do not provide as active support for internationalisation activities as they could.

There is also a perceived need to reduce the barriers to entry for Danish SMEs by providing stronger incentives for universities to partner with Danish companies in their FP projects and providing stronger assistance to small businesses to help them to participate in the programme.

Proposals put forward for enhancing the arrangements include:

- Integration of FP participation as a significant ‘success criterion’ when assessing any national proposals for funding
- Improving the strategic alignment and complementarity between national research programmes and the FPs, both at a topic level and in terms of funding support
- Provide more ‘automatic’ funding to cover the proportion of project costs (25 per cent) not reclaimable by university researchers for their FP projects and / or commit to retain and increase the REWARD fund
- Strengthen the incentives for universities and institutes to partner with Danish companies in FP proposals and projects
- Provide more financial and practical support measures to SMEs to encourage and assist them in engaging and participating in the FPs.

#### **GREATER PROMOTION OF THE OPPORTUNITIES AND THE SUPPORT AVAILABLE**

It appears that, despite the best efforts of the CSOs and EuroCenter there is still a considerable lack of awareness of just how much help is out

there. Many negative perceptions still surround the FPs, with many actors not wishing to take part due to the perceived high administrative burden and low success rates. Interviewees had different experiences as to whether FP ‘bureaucracy’ has been getting better or worse but all acknowledge that good support is available, much of which is focused on reducing administrative burdens and helping applicants and participants negotiate their way through the FPs as smoothly as possible.

Many commentators feel that the ‘mental’ or ‘perceptual’ barriers to FP participation are worse than the reality, and that many prospective applicants are put off by what they have heard about the FPs rather than because of recent experiences. While there is certainly a significant learning curve associated with FP participation, if applicants can access the considerable amount of support that has now been put in place, then the reality of FP participation can be highly positive. Many of the respondents to our questionnaire have called for forms of support that we know already exist, suggesting a lack of awareness among many participants as to the nature and quality of the support that is available. It is therefore vital to continue to do everything possible to promote the available support to all sections of the community.

#### **IMPROVED SHARING OF GOOD PRACTICE IN FP SUPPORT PROVISION**

It is clear from our discussions with the university CSOs that the level of knowledge and experience contained within these units varies considerably, as does the extent to which ‘best practice’ in support provision is in place. Some CSOs have addressed specific problems that others continue to struggle with. For example, some universities face considerable problems in relation to time recording and financial management, and appear to have management information systems that are weak or are incompatible with FP reporting requirements, while other CSOs have much better systems and have developed tools to help to overcome these problems. In addition, the different arrangements inside, the universities in some cases allow the CSOs to have a very good over-

sight and data on levels of demand and success, allowing them to be much more strategic in their approaches, while others operate within more de-centralised systems that limit their ability to do the same. In short, practice varies widely.

We have been told that FP support staff from the universities meet twice a year in order to discuss issues and share practice, and most are also actively involved in the Danish Association for Research Managers and Administrators (DARMA) and its European equivalent. These forums provide a mechanism for discussion of issues and the sharing of good practice, and go some way to raising the level of performance within some of the less developed or capable units. The EuroCenter also plays a role in assisting the CSOs to strengthen their operations, and in this sense helps to improve practice across the university system. However, there still appears to be greater scope for ensuring that ‘best’ practices are more widely adopted. Accordingly, we see potential for the EuroCenter to be assigned a stronger role in (i) the identification and sharing of good practice in FP support provision at institutional level, and (ii) in monitoring and understanding performance and in assessing the effectiveness of specific measures, so that they can help the universities to improve their performance over time.

One other issue concerns the continuity of staff in the FP support units. The support provision that is in place relies heavily on the accumulated knowledge and experience of the individuals employed within the EuroCenter and the university CSOs, and so it is vital to ensure that staff turnover is kept to a minimum. While it is important for advice and guidance to be documented, there is no substitute for people who have inside knowledge, experience and contacts. As such efforts should be made to ensure that CSO and EuroCenter staff have good career paths and that staff ‘rotation’ is kept to a minimum, particularly among those who have built up ‘specialist’ expertise that cannot easily be substituted for elsewhere.

### **STRONGER DRIVES TO REDUCE ADMINISTRATIVE BURDENS**

As indicated above, many university CSOs play an increasing role in carrying out the financial and administrative management of FP projects, relieving the scientists of what is largely considered to be an unwelcome burden. While this support is welcomed and effective it is a case of alleviating the symptoms of the problem rather than addressing the cause. Many commentators stated that not enough is done by national administrations to curtail the excessive, burdensome, and non-value-adding administrative and reporting requirements imposed by the Commission. We therefore received strong calls for the Ministry to tackle the issue of administrative complexity and reporting burdens at the EU-level through negotiations with the Commission.

Researchers have pointed out that the administrative procedures of the FPs have clearly been designed without sufficient reference to how the scientific communities typically operate, and that too much of the funding is consumed in administration and reporting, reducing the efficiency of the research and the value that can be derived from the very considerable volumes of funding being spent. Some cite this as the most serious problem with the FPs at present, and they have argued strongly that the Commission should look to overhaul and radically streamline these aspects for FP8. In order to do this effectively it is vital that new procedures are worked out between the Commission officials and the scientific community, so that the levels of accountability required by the former can be addressed in a way that makes sense from the perspective of the latter.

CSOs have also called for better coordination and integration of administrative procedures and requirements across the different EU-level programmes and even across the different parts of the FPs. All appear to have different rules for grant rates, overhead rates, audit procedures, reporting procedures, accounting procedures, and so on, and while dedicated units can develop the knowledge and expertise to cope with the various different requirements, the costs of doing so are

very large and certainly disproportionate to the level of additional control / scrutiny achieved.

#### **INCREASED PROMOTION OF DANISH STRENGTHS**

Some of the stronger research groups and companies with higher historical levels of participation noted the importance of being a leading player within the European landscape. Demand for participation does not only come from within, but can also be driven by other organisations across the EU seeking to partner with Danish actors. In some areas of food and health where Denmark is a leader internationally the participants pointed out that they are often approached by others seeking to involve them in their consortia, and this is an obvious but often overlooked ‘demand’ driver that helps to increase participation levels. Being a strong player also increases opportunities to influence the work programmes, so a strong national funding system leading to enhanced national research capabilities is, for some, the most effective way to drive up external demand and hence participation levels.

Most universities also have a reasonably good central overview of their own strengths and weaknesses, but this information is not always documented or well packaged and is rarely converted into any kind of strategy for FP participation. Some institutions have begun to develop clearer overviews of where they feel they are internationally competitive and have begun to use this information to promote their capabilities to prospective partners internationally. However, many interviewees have argued that Denmark does not do a particularly good job promoting its capabilities and that it lacks a good overall picture of current and developing Danish research strengths. In order to facilitate improved promotion many consider it important to build a better picture or mapping of Danish research capabilities, linked to FP research areas and priorities.

There are also opportunities to strengthen partner searching and matching, particularly for companies. Most scientists are well networked, have good collaborative links and can understand

through publications, conferences, etc. which are the leading groups active in their area. Companies find it much harder to work out who to partner with. Current mechanisms to help prospective participants to find partners and build consortia are not considered to be particularly strong in Denmark, and so we have received a number of calls for the creation of a database or improved map of capabilities and a more strategic view of which parts of the Danish community do not currently apply but have the potential to.

#### **IMPROVED INTELLIGENCE ON WHERE LEVELS OF DEMAND ARE HIGH / LOW**

As we have detailed, the main challenge for Danish FP participation is to increase levels of demand for participation, but there is currently limited data and evidence on where levels of demand are high/low in relation to Danish capabilities and potential to participate. Some university CSOs have a good strategic overview of demand and participation levels across their institutions and can describe areas of strength/weakness. Others have only a very limited understanding of this. Those CSOs that operate within more centralised, controlled environments have better data and can be more targeted and strategic in their approaches to promoting the FPs and generating increased demand.

Within the wider national context (including the industrial sphere) there also appears to be a relatively under-developed understanding of national capabilities and no good oversight of where Danish potential to participate in the FPs is high or low and hence where participation levels (and demand) are strong or weak. For this reason it is argued that more should be done at national and institutional level to map Danish research strengths (as indicated above) and to use this map as the basis for improved analysis of where demand and participation levels are below the levels that could be expected. This should permit more effective targeting of promotional and support activities. In addition, it has been suggested that the Ministry, possibly in conjunction with other Member State authorities, should speak to the Commission about improving the frequency and

quality of data available on proposals submitted to the FPs, with a full clean account being delivered promptly after the completion of each call.

#### **INCREASED COLLABORATION BETWEEN DANISH UNIVERSITIES AND COMPANIES**

We also received a number of claims that there are not enough strategic partnerships being formed at national level, and an insufficient level of collaboration within the academic and between the academic and industrial communities within FP projects. Denmark is considered to have strong academic-industrial linkages outside of the FPs but for a variety of reasons there continues to be barriers to collaboration within it.

Some actors blame the university culture, which they claim does not always incentivise or reward industrial collaboration, while others indicate that their Research Council does not recognise or support the more applied work that is often carried out within the FPs. There are also claims from industry that the universities are too protective of (and overvalue) their IP, while the academic researchers often state that industry expects to get ‘everything for free’. These cultural barriers need to be investigated more thoroughly at national level and measures put in place to help to overcome them.

#### **MORE SUPPORT FOR SMES**

There continues to be particular problems with barriers to entry for smaller companies and many commentators – academic and industrial – have argued that more could be done to understand the specific problems that SMEs face and help to alleviate these. SMEs do not have the same support structures in place as the universities and research institutes. We have heard that there are many small, capable companies that could participate and want to get involved but the administrative barriers are too high, and there is no CSO to hold their hand through the process. The EuroCenter is the main support provider and clearly provides a very good service but despite its encouragement and support it is hard to get them involved because many of the FP procedures seem to be designed to keep them out.

SMEs that do have strong participation in the FPs have said that the process of applying, even as a partner, is a lot of work and that there is a limit to how many proposals they can get involved in simply due to resource limitations at the proposal preparation stage. Some see many opportunities to increase their level of participation in the FPs but simply do not have the resources to contribute to multiple proposals. If they were able to access financial support to cover the costs of meetings and proposal development then they would definitely increase their participation. In this respect, the problem relates less to insufficient demand/opportunity and more to insufficient capacity to participate more actively.

There appears to be scope to strengthen the support provision to SMEs and for more to be done to promote their involvement. Some commentators have suggested that, as the universities strengthen their CSOs and FP support functions, there is less of a need for the EuroCenter to continue to assist the universities, so its focus should be directed towards industrial participation. It is clear that the EuroCenter is playing an important and effective role in relation to both communities, so this is not something that we would necessarily advocate, but there does appear to be a strong case for greater levels of practical and financial support to SMEs.

#### **AVOIDING UNREALISTIC LEVELS OF DEMAND**

While pointing out that the recent drives to increase FP participation are welcomed, some commentators have argued that these should not become so strong that they encourage unrealistic levels of demand for participation. Scientific collaboration is about sharing competencies and knowledge that is over and above the ‘basic’ level of competence and know-how that most or all research groups have. Participants have to want to access new capabilities and knowledge and have to be prepared to give some of their own knowledge away in exchange. All research organisations should have a good complement of such people but it is not realistic to expect that all researchers will want or need or be effective at collaborative research. It is therefore impor-

tant not to make FP funding so high a priority or provide so many incentives that groups that do not want or do not need to collaborate are encouraged to apply, as it is likely that their success rates will be low and that they will gain less from the collaboration than they should.

## 4.4 Strategies to increase success when applying for FP funding

### 4.4.1 Danish success rates when applying to the FPs

As detailed in Sections 3.9.1 and 3.9.2 Danish success rates when applying to FP6 and FP7 were well above average, overall and in most of the Priority Areas. The reasons for these high success rates are unclear, but are likely to be driven by the strength of the applicants, the quality of the proposals, and the fact that national research funding in Denmark is strong enough to mean that FP proposals are only likely to be submitted when there is a high level of European added value (i.e. not just because the research groups need to obtain funding).

### 4.4.2 Strategies and measures employed to increase Danish success rates in FP competition

#### 4.4.2.1 Support provision

We have described in Section 4.3.5 the main measures in place to support prospective applicants in applying to the FPs. It is known that the

high level of effort involved in making an application to the FPs and the perception that success rates are low do combine to act as a disincentive and do diminish the propensity of people to apply. As such, assistance in relation to proposal development is a means to not only improve success rates but also to help increase levels of demand. The measures that are in place will not be repeated here, but suffice to say that both the university CSOs and the EuroCenter provide a great deal of practical advice and guidance in relation to all aspects of the FP proposal development and application procedure.

#### 4.4.2.2 Take up of support

Respondents to the questionnaire were asked to indicate which forms of assistance their organisation or research group had accessed in order to increase its chances of success when applying to FP6/FP7 funding. Figure 18 shows the five forms of assistance that were suggested in the questionnaire and the proportion of respondents who reported having accessed each type. It shows that *advice on European Commission rules and procedures* is clearly the most wide spread form of assistance being used, with 62 per cent of respondents reporting having accessed this in order to increase their chances of success. The other forms of assistance listed were much less commonly accessed, being cited by between 20 per cent and 34 per cent each.

**Figure 18 – Extent to which different forms of assistance have been accessed to increase chances of success in applying for FP funding (n=289)**

Form of assistance	Used
Advice on EC rules/procedures	62%
Advice/feedback on draft proposals	34%
Help with preparing/drafting proposals	31%
Help with the preparation of ideas for FP6/7 proposals	29%
Help with identifying partners	20%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

What is notable about the results from the questionnaire survey is that the majority of applicants did not avail themselves of the support that is on offer. In fact, responses to the questionnaire suggest that many participants are not aware that support is on offer as evidenced by the fact that a significant number suggested that these forms of assistance should be put in place. We are also aware, however, that many researchers choose not to seek assistance with proposal preparation, even where they know that support is available. In some cases this will be because they believe they have the necessary experience themselves, and in other cases it will be because they are acting in the role of partner and are able to meet the requirements on their own.

#### 4.4.2.3 Effectiveness of strategies employed to increase Danish success rates

Those respondents who had accessed assistance in order to increase their chances of application success were asked through the survey questionnaire to indicate their level of satisfaction with the support that was provided. A summary of the feedback is presented in Figure 19 below, which shows (i) the proportion of ‘users’ reporting they were (very) satisfied, and (ii) the proportion who were (very) dissatisfied (those who were ‘neutral’ are not shown). The table is sorted by the ‘net balance’ of responses (i – ii), so the areas of comonest satisfaction appear first.

The results are fairly consistent across the different forms of assistance, with greater numbers of satisfied than dissatisfied users in each case.

However, satisfaction with mechanisms to *help with identifying partners* is significantly lower than the others listed, with only one-third of users reporting satisfaction and one-in-five stating that they were very dissatisfied. The results also suggest that there are greatest levels of satisfaction with mechanisms to *help with preparing / drafting proposals* and to *get advice / feedback on draft proposals*. Yet, as Figure 18 above indicated, these support mechanisms are only used by a relatively small proportion of Danish participants (31 per cent and 34 per cent respectively).

#### PARTICIPATION IN EVALUATION PANELS

While a fairly comprehensive package of support is available from dedicated support providers, many commentators suggested that applicants should seek to become involved in FP evaluation panels themselves, as this is a means by which they can gain a far deeper understanding of how to succeed with their proposals. Respondents to the questionnaire were therefore asked whether they had participated on a Framework Programme evaluation panel, assessing FP applications on behalf of the Commission. Just under one-quarter (23 per cent) reported that they had, and of these the majority (60 per cent) were from higher education organisations, with the remainder split evenly between industry, research organisations and ‘others’.

Those respondents who reported that they had participated in Framework Programme evaluation panels were asked to indicate the extent to which this experience had strengthened their ability to

Figure 19 – Level of satisfaction with support provided to increase chances of application success

Type of assistance	Dissatisfied	Satisfied
Advice/feedback on draft proposals (n=97)	8%	59%
Help with preparing/drafting proposals (n=89)	12%	60%
Advice on EC rules/procedures (n=177)	10%	47%
Help with the preparation of ideas for FP6/7 proposals (n=83)	17%	49%
Help with identifying partners (n=57)	21%	33%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

write successful FP6/7 proposals. All-but-one of the individuals concerned felt that it had helped to some degree, but the extent to which this was the case varied, with a relatively even split between those that thought it had strengthened their ability to a 'small' (28 per cent), 'medium' (35 per cent) and 'large' (31 per cent) extent.

While a significant minority of the respondents to our questionnaire had participated as evaluators, an analysis of Danish involvement in FP7 evaluation panels reveals that Danish participation is actually relatively low, even in those areas (such as food and health) where it might be expected to be strong. For example, under FP7 to date Denmark has accounted for 2.9 per cent of the participations in both the Food and Health Priority Areas but made up just 1.4 per cent of the experts on the 2007 and 2008 evaluation panels in these two areas.

This weakness is recognised by the EuroCenter and many university CSOs, and all encourage participation on FP evaluation panels. Many CSO and EuroCenter staff have acted as evaluators and believe that this has significantly strengthened their ability to advise on draft proposals and write guidance on how to prepare strong bids. Participants who have acted as evaluators also appear to have found the experience useful, and would recommend it to others. However, there appears to be little demand and few incentives in place for what is sometimes perceived to be a difficult and not particularly pleasant task, and institutional efforts to increase participation in evaluation panels do not appear to be having the desired effect.

#### **4.4.3 Areas where more could be done to increase Danish success rates in FP**

All respondents to the survey questionnaire were asked to consider what the most important aspects were to focus on when preparing an FP proposal in order to maximise the chances of success. A large number of often-detailed answers were given, containing a number of suggestions for important areas to focus on. There would appear to be a clear sense from these responses that for proposals to be successful, they need to have focus

and balance across a number of different areas, ranging from the structure of the proposal to consideration of the impact of the proposed project on the wider world. The main areas considered as important aspects to focus on when preparing an FP proposal were as follows:

- Choose the right project partners (high quality, experienced, complementary)
- Adhere to the call text and ensure relevance, coverage, good fit, etc.
- Ensure high scientific quality and relevance
- Seek dialogue with / assistance from the EC for help, information and feedback
- Develop a clear, organised and feasible workplan and management structure
- Have a 'good idea' (high quality, focused, ambitious, etc.)
- Adhere to the administrative requirements
- Offer clear aims, goals and deliverables
- Choose the right coordinator (enthusiastic, experienced, supported, etc.)
- Produce a generally 'well written' proposal that is clear and well structured.

Interviewees provided few additional recommendations as to ways in which Danish success rates could be enhanced. However, as with all aspects of the support on offer, there is scope for improved sharing of practices and strategies across the university CSOs and with the EuroCenter, in order to ensure that the support providers can continue to strengthen their role in helping to maintain high success rates. A small number of other issues were raised in relation to Danish applications to the FPs.

#### **THE NEED FOR IMPROVED COORDINATION OF DANISH PROPOSALS**

We received a number of comments that in some areas (e.g. food) there is competition between Danish proposals submitted to the FPs, with university groups competing rather than collaborating on very similar topics. Some commentators argued that there is little coordination and collaboration nationally and that more should be done to coordinate bidding approaches both inside and across institutions. While this has begun to hap-

pen in some areas, several CSOs have reported that they are not yet able to do this even within their own institution, as choices as to whether and where to apply are left to individual researchers and there is no central oversight. For this reason it is likely that the challenge of coordination across institutions will be very significant.

#### DEADLINES FOR CALLS

Some of the FP support units expressed dissatisfaction that the deadlines for FP calls all fall at the same time in the year (i.e. for most / all Priority Areas). This creates an annual spike in the demand for support that often cannot be satisfied. If the call deadlines were phased more evenly across the year, the CSO support could be more effective. This is something that requires further consideration at national level in order to inform a position that the Ministry could carry forward to negotiations at EU-level.

## 4.5 Strategies to support participation during FP projects

### 4.5.1 Danish roles in Framework Programme projects

In section 3.6 we presented data on Danish project coordination rates in FP6 and FP7, revealing that Danish participation rates were very slightly below the average rates for the two programmes. However, we also showed that Danish funding levels per participation were above the average for FP6, suggesting that the Danish partners do occupy a fairly significant role within the partnerships. In order to help to further understand whether Danish partners have central roles in FP projects, or whether they are involved more at the periphery of activities, the survey asked participants to indicate the extent to which their organisation or research group has typically played different roles in the design and implementation of their FP projects.

The responses suggest that the majority of Danish participants have typically occupied either the 'primary role' or a 'major role' with regard to most aspects of their projects, particularly *defining the content / scope of projects, defining*

*project objectives, and in actually carrying out the research.* Most also indicated that they typically occupied a major or primary role in relation to *dissemination and exploitation, and in planning/coordinating future research.*

The responses suggest that there are only three areas where Danish organisations more commonly play a minor role. These are (i) defining the size and membership of the consortium, (ii) negotiating the IPR arrangements, and (iii) research training.

Participants from industry and private research organisations are much more likely than those from higher education and public research to have played a major role in relation to *negotiating the IPR arrangements and exploiting the results of the project.* At the same time, these private sector participants have typically played lesser roles in relation to *research training and the planning and coordination of future research.*

### 4.5.2 Strategies to assist participants in managing their involvement in FP projects

Questionnaire respondents were asked what advice they would give to other Danish participants concerning ways to successfully manage their involvement in FP projects. The suggestions given can be summarised by the following main points:

- Establish well-qualified and experienced administrative support which can take on the administrative / financial requirements of FP projects
- Establish a good network of strong and suitable partners that will result in an active and productive project consortium
- Carefully plan activities and then ensure efficient day to day management and coordination of activities during the project
- Maintain good regular contact across the consortium throughout the project
- Ensure the project has good coordination and leadership, with a coordinator that is experienced and professional, and has sufficient administrative support
- Ensure that the project focus has a solid research and commercial foundation, that it aligns closely

with existing activities, and that it is not being invented to secure funding

- Be aware of and understand the administrative requirements on you and dedicate time and thought to the necessary activities from the start of the project
- Be aware that the research will require dissemination, consuming time and resources, and should be a key priority within the project.

Responses were evenly matched as to whether Danish participants should try to take on the role of a coordinator (or work package leader) or not, with most stressing that this should not be done in the absence of sufficient experience of FP procedures and / or a good level of administrative support.

We received relatively few comments from interviewees concerning problems encountered by participants during the implementation of FP projects. The major issues relate to aspects already discussed above, and specifically the very high administrative and reporting burden that falls particularly on coordinators. These issues have been described in Section 4.3.2 so will not be repeated here.

As we have already discussed, the university CSOs are now providing a range of support designed to alleviate the administrative burden, and increasingly there is a trend inside the universities to the ‘professionalisation’ and centralisation of FP project management. Some CSOs have also begun to develop courses on good management of FP projects, but we received little feedback on these from participants. This active support is clearly going a long way to improving the experience of FP participation among researchers and may help to overcome some of the barriers that limit demand for participation.

Despite the good progress being made, it appears that there are still lots of internal ‘information management’ issues within some universities. In many cases the university management information systems are weak and / or incompatible with the financial and administrative requirements imposed on FP projects, and this creates signifi-

cant challenges and problems for both researchers and CSOs. Many of the university information systems have been set up for teaching rather than research, and there is a particularly weak culture of time recording, with some universities having no history of it and no systems to deal with it efficiently. Some CSOs are facing challenges in getting their internal management information system to function well at the project level (as opposed to working on fiscal years). In addition, the various different funding streams place different accounting and reporting demands, and the systems in place are in some cases simply not able to cope. Overhead calculations were also often cited as a significant issue that many researchers struggle with. Again we found that the extent of the problems and the extent to which they have been addressed varies markedly across the university system, with some CSOs managing to arrive at a point where these problems have largely been eradicated while others continue to struggle to address them.

We have also been told that there are incompatibilities between the approaches and requirements of national auditors and those employed by the EU, with each having different systems, arrangements, expectations, information requirements, formats for providing information, and so on. This creates a further administrative burden inside the universities, leading to inefficiencies in the administration of research.

#### **4.5.3 Areas where more could be done to assist Danish participation during FP projects**

The trend towards professionalisation and ‘outsourcing’ of administrative and financial project management is in line with developments in other countries, and the universities appear to be doing a good job in this respect, expanding their competencies in this area and helping to free the researchers up to focus on the research. As before, the question has to be asked whether the Commission’s requirements are reasonable and proportionate, and whether the Ministry should, in collaboration with other national administrations, lobby more strongly for a simplification of rules and a streamlining of procedures. Some par-

participants have argued that it does not really matter what rules and requirements are put in place so long as they remain in place for a long enough period of time. However, most commentators believe that they are so onerous that something has to be done to improve the situation.

There also appears to be a need to strengthen management information systems and time management and recording procedures inside some of the universities, as practices here vary considerably, and many are struggling with systems that are not fit for purpose. FP project administration is known to be difficult and complex and ‘weak’ information systems inside the universities make these aspects harder rather than easier to deal with.

There is also a potential issue with regard to the level of support available for SMEs during the projects. University researchers are now able to access a great deal of very good support with management and administration, but it is not clear that SMEs enjoy the same level of support. While project coordination rates by Danish companies are below (approximately half) the level of the universities, there are still a significant number of companies that coordinate FP projects. The EuroCenter is very good at encouraging participation and helping to explain how the whole process works, but it is not clear that it is able to provide support to SMEs across the whole cycle of participation. Industry participation rates appear to be in line with the FP averages as a whole, but Danish industry receives a far lower share of the funding than might be expected, given the number of participations. As such there appears to be room to find ways to strengthen their role in the projects. It is likely that improved support in the area of financial and administrative management could help to strengthen their level of involvement and their role within the projects.

## 4.6 Benefits and impacts of FP participation

### 4.6.1 R&D and innovation outputs delivered through participation in FP projects

Respondents to the survey questionnaire were given a list of 17 different types of output that might be delivered through their FP project(s). They were asked to rate the importance of these outputs to their organisation or research group when participating in FP projects. They were then asked to indicate the extent to which their FP6/7 projects have successfully delivered (or are expected to deliver) each type of output to their organisation’ or research group’s satisfaction.

#### IMPORTANT OUTPUTS FOR DANISH ORGANISATIONS AND RESEARCH GROUPS

Figure 20 shows the proportion of respondents indicating that each output was of ‘medium’ or ‘high importance’ to their organisation or research group when participating in FP projects. It is clear from the results that the more ‘academic’ outputs dominate, largely because of the high ratio of academic to industrial participants within the programme and also within our pool of respondents. The more commercial outputs – products and services, patents, invention disclosures, etc. - were considered as important outputs by only a minority of respondents.

Figure 20 – Importance of FP project outputs

Output	Of medium/high importance
Publications in refereed journals and books (n=289)	82%
Scientific conferences, seminars or workshops (n=290)	81%
New research grants (n=286)	81%
Newly trained/qualified personnel (e.g. MSc, PhD, postdocs) (n=286)	72%
Other publications (n=283)	57%
New or significantly improved tools, methods or techniques (n=209)	52%
Exchange of personnel (in or out) (n=285)	48%
New or significantly improved commercial products or services (n=234)	39%
New or significantly improved scientific or industrial processes (n=255)	33%
Invention disclosures (n=275)	32%
Patents granted (n=279)	30%
New or significantly improved technical codes or standards (n=261)	30%
Patent applications (n=279)	29%
New license agreements (n=276)	25%
Awards or prizes (n=283)	21%
New or significantly improved regulations or policies (n=195)	4%
New or significantly improved facilities or infrastructure (n=80)	0%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

### THE EXTENT TO WHICH OUTPUTS ARE DELIVERED THROUGH PARTICIPATION IN FP

For each of the 17 different types of output shown above, the majority of survey respondents (62 per cent+) reported that they had been (or would be) produced by their FP project to an extent that was at least ‘in line with prior expectations’. However, for a minority outputs have been / will be produced to a greater or lesser extent than was expected. Calculation of a net balance of responses (i.e. the proportion of respondents reporting ‘above expectation’ delivery of an output, minus the proportion reporting ‘below expectation’ delivery) suggests that projects are most commonly “over performing” (compared to expectations) in relation to the delivery of the following outputs:

- Scientific conferences, seminars or workshops (+24 per cent net balance)
- New or significantly improved tools, methods or techniques (+14 per cent)
- Publications in refereed journals and books (+12 per cent).

Projects are most commonly “under-performing” in the delivery of the following outputs:

- New or significantly improved facilities or infrastructure (-38 per cent)
- New license agreements (-20 per cent)
- Patents granted (-19 per cent)
- Patent applications (-17 per cent).

In order to understand more clearly the extent to which the delivery of outputs ‘below’ expectations might represent a significant issue, Figure 21 below considers just those individuals who rated the production of a particular output as of ‘medium’ or ‘high’ importance, and shows the proportion of these same respondents who reported that the output was delivered ‘below expectations’. The table is sorted so that the areas of common ‘disappointment’ appear at the top of the list.

This highlights a number of areas of regular ‘disappointment’ for participants, and again it is notable that some of the more commercially oriented outputs appear towards the top of the list. This suggests that these types of outputs are not only considered to be important by a minority of participants, they are also the most likely to be delivered at a level below expectations.

A number of interviewees raised the issue of academic / industrial collaboration within the FPs, arguing that Denmark should be well placed

to develop strong public / private partnerships that offer good potential for commercial innovation linked to FP projects. For many there is an insufficient focus within the FPs on the commercial exploitation of the knowledge developed within the projects. It is argued that FP funding should be creating the opportunity for scientists and industrialists to come together to develop *and transfer* new knowledge to businesses in ways that foster greater levels of innovation and commercial development. For many there should be a stronger push from the Commission on this issue, and were that to happen it would create greater opportunities for Danish participation, particularly by industry.

#### 4.6.2 Realisation of tangible and intangible benefits from FP projects

##### EXPLOITATION OF PROJECT RESULTS BY DIFFERENT COMMUNITIES

The survey questionnaire sought to understand whether and to what extent the results of FP

Figure 21 – Extent to which ‘medium/high importance’ outputs are produced at a level ‘below expectations’

Output (% reporting output as of m/h importance)	% reporting ‘below expectations’ achievement
New license agreements (25%)	47%
Patents granted (30%)	41%
New research grants (81%)	31%
Patent applications (28%)	29%
Invention disclosures (31%)	26%
Awards or prizes (21%)	25%
Exchange of personnel (in or out) (48%)	20%
New or significantly improved technical codes or standards (30%)	17%
New or significantly improved commercial products or services (39%)	16%
Publications in refereed journals and books (82%)	9%
New or significantly improved tools, methods or techniques (52%)	7%
Other publications (57%)	6%
New or significantly improved scientific or industrial processes (33%)	6%
Newly trained/qualified personnel (e.g. MSc, PhD, postdocs) (72%)	5%
New or significantly improved regulations or policies (4%)	4%
Scientific conferences, seminars or workshops (81%)	1%
New or significantly improved facilities or infrastructure (0%)	0%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

projects with Danish involvement have been exploited by (i) researchers, (ii) companies, and (iii) policymakers, in (a) Denmark, (b) European countries, and (c) beyond Europe. Responses suggest that results from the majority of Danish projects have been exploited first and foremost by researchers in follow-on projects; more so by Danish and other European researchers than by those elsewhere in the world. In addition, almost half of respondents suggested that their projects have been exploited by Danish and other European companies, and by European-level policymakers. Just 41 per cent reported exploitation of the results of their projects by Danish policymakers.

#### **BENEFITS AND IMPACTS OF PARTICIPATION FOR DANISH ORGANISATIONS AND RESEARCH GROUPS**

Respondents were asked to indicate the scale of positive impact that their FP6/7 participation has had (or is expected to have) on their organisation or research group in terms of a range of different types of benefit. Feedback suggests that the main positive impacts realised by participants are (i) *improved relationships and networks*, (ii) *increased understanding/knowledge*, and (iii) *increased scientific capabilities*. In each case, more than 85 per cent of respondents reported 'medium' or 'high impact' in these areas. FP projects have also bestowed significant benefits in related areas such as *increased technological capabilities and enhanced reputation and image*.

There is accordingly a good degree of alignment between participants' motives for participation and the kinds of impacts realised, with developing and extending knowledge and capabilities and developing new and improved relationships and networks figuring as key motives for participation and also as areas of greatest and most widespread impact. This suggests strongly that FP participants are becoming involved in order to realise the kinds of benefits that FP projects are able to deliver, ensuring reasonably high levels of success as judged by the participants themselves.

Danish participants rate the development of new or improved relationships and networks as one of the main drivers for participation in the FP, and also the major area of benefit. The impact of improved relationships and networks was therefore explored in further depth through the survey by asking respondents about their project partners. Their estimates of the number of *all*, *new* and *enduring* partnerships in their FP6/7 projects suggest that on average:

- These Danish participants collaborated with just under 16 partners in each of their FP6/7 projects
- Over half (58 per cent) of these partners were 'new' (i.e. they had not previously collaborated with them), and
- They expect to work again with half (46 per cent) of these 'new' partners in the future.

Applying these figures to the ~17,000 non-Danish participations in Denmark's FP6 projects (see Section 3.10.3), this would suggest that FP6 projects brought Danish participants into contact with approximately 10,000 'new' partners, and that the number of these that went on to become enduring partnerships was in excess of 4,600.

#### 4.6.3 The overall costs and benefits of participation in FP projects

Survey respondents were asked to assess on a 7-point scale how the costs and benefits associated with their own organisation or research group's participation in FP6/7 projects balanced out. It can be seen from the results presented in Figure 22 below that more than two-thirds (68 per cent) of Danish participants realised a positive benefit to cost ratio, 15 per cent indicated that the costs and benefits were evenly balanced, and 17 per cent indicated that the costs of participation had outweighed the benefits.

Those respondents reporting a negative benefit to cost ratio indicated that there were problems with the following main areas:

- Too much administration and bureaucracy relative to the funding and time available, resulting in costs outweighing any research / scientific benefits
- Too little funding available relative to the additional EU administrative costs, plus difficulties securing sufficient co-funding
- Lack of benefit realised from the scientific outputs of projects
- Too much effort and complexity involved in coordinating a project and few advantages.

Those respondents reporting a positive benefit to cost ratio indicated that the main reasons for this balance included:

- New / enhanced (European) contacts, partners and collaborations
- Direct financial benefit from the adequate / high EC contribution to costs
- Improvements to internal knowledge and expertise
- Research that would not have been possible otherwise, either through national funding or internal resources
- Maintained / increased European profile, reputation and prestige
- Additional employment and training opportunities, both in science/research and in the management/administration of projects
- New opportunities for further research / funding, building on the FP project and the collaborative links and prestige created
- Other benefits, including achieving a critical mass of partners and funding, commercial exploitation of results, publications, new tools, methods and techniques, good science and research, new facilities, and improved morale.

Figure 22 – Costs & benefits to Danish partners of participation in FP projects (n=137)

Costs outweigh benefits			Costs equal benefits	Benefits outweigh costs		
-3	-2	-1	8%	+1	+2	+3
2%	4%	11%	12%	20%	26%	21%

Source: Survey of Danish participants in FP6/7 (Technopolis, November 2009)

## 5. Conclusions and recommendations



## 5.1 Introduction

This section of the report presents our main conclusions and recommendations, based on the findings set out in the preceding sections of the report. It should be noted that those sections provide a more detailed account of the issues raised and ideas put forward by Danish participants and support providers, and we would suggest that these should also be considered by the Ministry when deciding on the steps it will take to further strengthen Denmark's participation in the Framework Programmes (FPs).

## 5.2 Danish participation in FP6 and FP7

### 5.2.1 Overall levels of involvement

Denmark had a good level of involvement in FP6, and has managed to achieve a good level of involvement in FP7 to date:

- Danish actors were involved in 1,1210 FP6 projects, realising €396 million in funding across 1,641 participations
- To date, Danish actors have participated in 311 FP7 projects, realising €136 million in funding across 399 participations.

The level of 'success' achieved in terms of FP participation by individual countries has traditionally been measured by comparing the share of FP funding received by each to their share of the EU budget, which is broadly based around their share of EU Gross Domestic Product (GDP). On this measure we can conclude that Denmark has performed well in both FPs, achieving funding returns at levels 39 per cent and 25 per cent above its share of contribution to the EU budget for FP6 and FP7 respectively. Denmark's financial returns achieved from FP6 and FP7 can also be seen to be significantly 'above average' in relation to the (comparative) size of its population, and very slightly above average in relation to its comparative level of Gross Expenditure on R&D.

While Danish involvement in FP6 and FP7 to date has been relatively strong on most measures, the

participation data show that Denmark's share of participations and funding has previously been at higher levels, and that there is a clear downward trend in its share of participations from FP5-7 and in its share of funding, from FP4-7. Some element of this decline can be attributed to European enlargement, but the data shows that the fall in Denmark's FP participation and funding is larger than has been the case in comparator countries such as Sweden, Finland, Norway and the Netherlands. There is clear evidence that Danish involvement in the FPs has been weakening across successive programmes, although it is perhaps still too early to judge whether this downward trend will continue across the full course of FP7 or whether there will be a reversal in fortunes.

### 5.2.2 Participation by different parts of the community

The breakdown of Danish participations in FP6 by main type of organisation (Higher Education institutions - HEIs, research institutes, industry and 'others') is broadly in line with FP6 average for all countries combined, although Danish HEIs have accounted for a larger share and Danish research institutes have accounted for a lower share. This is likely to be due to the structure of the Danish research landscape in comparison with Europe as a whole, rather than due to particularly strong or weak performances by HEIs and research institutes respectively.

When we consider the share of FP6 funding received by each main group of participant we find that Danish HEIs' share of the funding is higher than we might have expected and that Danish companies' share is lower than expected. This is largely because the HEIs obtain funding volumes per participation that are much higher than average while Danish companies achieve funding amounts that are much lower than average. These data suggest that Danish HEIs occupy fairly major roles within their FP projects, taking on more of the work, while Danish companies occupy smaller roles. The reasons why this is the case is not entirely clear.

Unfortunately, the data on Danish participation in FP7 to date did not allow us to establish

whether this pattern has continued in the current programme, nor could we determine whether it existed in FP5. As such it is not possible to determine whether it is an enduring pattern or simply an unusual feature associated with FP6.

### 5.2.3 Participation in the different Priority Areas of the Programmes

Denmark participated in all 17 thematic Priority Areas of FP6. In terms of absolute scale, the most significant areas of Danish involvement were *Life sciences* and *Sustainable development*, with Denmark achieving more than 150 projects, 200 participations and €80 million in funding within each. However, in relative terms, Danish involvement was highest in the *Life sciences*, *Food quality and safety*, *Sustainable development*, *Science & society*, *Policy support and Support for coordination of activities* areas.

At the time of writing this report, Denmark had not yet participated in all 22 of the Priority Areas under which FP7 is organised, but a similar pattern of participation can be seen. Danish involvement in FP7 has been highest in absolute terms in the *Health* and *IST* areas, with over 50 projects, 60 participations and €20 million in funding achieved to date. In relative terms, Danish participation has been strongest in the *Food*, *Health*, *Environment* and *Energy* Priority Areas.

These results indicate that within the FPs, Denmark is performing strongly in the areas where we would expect it to, based on its major industrial sectors and the known strengths of its research base. It is worth noting that Danish performance in the *Nanotechnologies* Priority Area appears to have improved significantly from FP6 to FP7, indicating a strengthening of performance in this important field.

## 5.3 Strategies for increasing the relevance of the FPs

### 5.3.1 Relevance of FP6 and FP7

The results of this study have shown that both FP6 and FP7 were of high relevance to the partici-

pating communities, and while we have only very limited feedback from ‘non-participants’ we received no strong indications from the universities or industrialists that these two programmes have been less relevant than the previous programmes (FP4 and FP5).

However, as indicated in the previous section there has been a trend to increasing specificity within FP calls for proposals, with the areas to be supported being defined more closely in terms of their scope and objectives and the Instruments that can be used to implement them. In some areas the call texts are so specific as to indicate to prospective applicants that only one project will be supported, and that the project has already been defined in some detail. This feature has been cited as a barrier to entry for some participants and may have served to reduce the relevance of FP6 and FP7. It is recognised that the FPs have been criticised in the past for generating high levels of demand that cannot be satisfied and that accordingly (in the past) proposal success rates have been very low in some areas. The trend to greater specificity in the call texts is one mechanism that has been used to suppress levels of demand, and it is unlikely that much can be done to change this situation, as issuing calls that are much more open in their scope are likely to create different but no less serious problems for applicants.

### 5.3.2 Strategies to improve the relevance of the FPs

Our investigations have identified a wide range of strategies and actions that are now in place in Denmark and that are aimed at increasing the relevance of FP work programmes and calls to Danish participants. The principal mechanisms are as follows:

- Provision of inputs to national representatives on the FP Programme Committees, either for new topics to be introduced or for amendments to the (draft) annual work programmes
- The establishment of Reference Groups in seven FP7 Priority Areas to strengthen national consultation on draft work programmes and to advise on ways to enhance Danish involvement

- Participation in EU-level conferences, workshops and other network activities at which the results of FP projects and plans for future research are discussed, usually with attendance by Commission officials responsible for the development of FP work programmes
- Participation in European Technology Platforms (ETPs), Joint Technology Initiatives (JTIs), Article 169 actions and other forums that are helping to set future FP research trajectories and priorities
- Participation on FP expert Advisory Groups giving direct access to and influence over Commission officials responsible for FP planning
- Participation in consultative processes connected to the FPs
- Submission of expressions of interest for FP projects or topics (where operated)
- Face to face meetings with, and provision of written inputs to, the Commission (often arranged through DANRO – the Danish EU Research Office)
- Participating in FP projects as a means by which to promote follow-on research and in order to gain improved access to the Commission and to networks that can influence the programme.

The various strategies outlined above represent a comprehensive body of actions that can be undertaken to influence FP priorities and work programmes. We have not identified any ‘influencing’ mechanisms that are known to be available but not currently being used at least to some extent by Danish actors. However, there is a collective sense within the research community that Denmark is not particularly strong at ‘lobbying’ and that there is potential to strengthen its approaches towards influencing the programmes. We have also found that in many cases the strategies employed are not rated as particularly effective, but Denmark is only one of at least 30 countries that are lobbying for national interests and so it is somewhat inevitable that not all of the efforts to influence the work programmes will be successful. Despite this, it is important for these efforts to be maintained and strengthened wherever possible. We identified a number of ways in which this might be achieved.

There is currently a lack of awareness of the Reference Group mechanism and there are also significant numbers of researchers that are not aware that it is possible for them to provide inputs to the draft work programmes. The Reference Group mechanism has only recently been introduced and so it is perhaps understandable that not everyone will be aware of it, but there is a clear need to raise awareness in order to ensure that all those who wish to contribute have an opportunity to do so. This is something that needs to be done at both national level and at the levels of the institutions that form the membership of the Reference Groups.

There also appears to be a strong case for improving the clarity of the final national positions adopted by the Programme Committee delegates in relation to each draft work programme, and for extending the Reference Group mechanism to cover other (possibly all) FP7 Priority Areas.

We recommend that the Ministry strengthen the Reference Group mechanism by (i) extending its coverage to other (possibly all) Priority Areas / Programme Committees, (ii) raising awareness among the research community as to the routes through which they can provide inputs to the draft work programmes, and (iii) publishing the final positions adopted by the Ministry and taken forward to the Programme Committee meetings.

Our investigations have also confirmed that the ETPs/JTIs and Article 169 actions have, over recent years, become important mechanisms for informing the FPs, but there is little information available on Danish involvement. Based on other findings it is possible that Danish involvement in these may not be as strong as it could or should be, and it is therefore important to develop strategies to promote and enhance involvement and to gain a good oversight of the level of Danish involvement within these (and any future) forums that can influence the programmes. It is also important that small countries such as Denmark

work in concert with other countries that have similar interests in order to strengthen its positions and negotiating power.

We recommend that the Ministry develop a strategy for national involvement in the major forums that can be used to influence the FPs, and collect and report data on Danish participation levels. We also recommend that any strategy for influencing the programmes include mechanisms to join forces with other Member States wherever possible in order to strengthen negotiations and increase the level of influence that can be attained.

It is becoming increasingly common for FP planning to be cross-sectoral in nature, and there are suggestions that FP8 may focus on ‘grand challenges’ that again are likely to combine research that crosses traditional disciplinary boundaries. In order to ensure that Denmark can be an effective player within these current and future developments it is vital that the Danish ministries, Research Councils and institutions improve the extent to which they are able to develop policies and approaches that are ‘joined up’ and more horizontal in nature. Effective cross-coordination of research planning and funding in Denmark may require the development of new structures and linkages within and between the major agencies and institutions, and we suggest that the Ministry begins to consider where this needs to happen and how it might be achieved.

We recommend that the Ministry investigate ways to improve cross-coordination of research strategies, planning and funding across sectoral and disciplinary boundaries, in line with developments at EU-level.

## 5.4 Strategies for increasing demand for FP participation

### 5.4.1 Danish demand for participation in the FPs

Because Danish success rates are high we should expect Danish participation levels to also be high, and on one level we can say that they are, at least as measured by the ratio of Denmark’s financial returns from the FPs in comparison to national contributions to the FP budget (which are based on GDP). However, we have shown that Denmark’s relative share of FP participations and funding has been declining steadily across FP4-7 and that Denmark has been losing ground overall and against key comparator countries such as Sweden, Finland, Norway and the Netherlands. From this perspective we can conclude that Danish FP participation levels have fallen below the level that it is possible to achieve and that might be considered desirable within the context of trends towards increased internationalisation of research communities and activities.

The combination of high success rates and falling levels of participation in the FPs can only lead to one conclusion – that levels of demand for FP participation within Denmark have been declining and, within FP6 and the early stages of FP7, were below the levels that could be achieved and that have been achieved in the past. Moreover, we conclude that in most FP6 Priority Areas high success rates rather than high levels of demand have been the major contributory factor to the levels of performance achieved, and therefore that there is scope to increase levels of demand in almost all areas of the programme.

The latest available information on Denmark’s involvement in FP7 (obtained from the Euro-Center) shows continued high success rates, yet a further decline in participation rates in recent FP7 calls. This suggests that Denmark’s demand for participation is also continuing to fall.

#### 5.4.2 Factors that reduce Danish demand for participation in the FPs

Our investigations have led us to conclude that there are a number of reasons underlying the downward trend in demand, which can be expressed in terms of factors that either depress or inhibit the tendency of Danish researchers to apply to the FPs. We have concluded that the principle reasons why demand for FP participation among Danish has been falling are as follows:

- The high levels of national research funding in Denmark over the past decade – public and private - which has created an environment where most researchers do not have to apply to the FPs in order to maintain strong research portfolios and build successful careers
- The perception that success rates when applying for FP funding are very low, and certainly lower than that achieved when applying for national funding
- The specificity of the FP calls, which place significant restrictions on the nature of the research that can be carried out, the kinds of partnerships that can be involved, the questions that can be tackled, and so on
- The very high management and administrative burden associated with FP participation, particularly for research project leaders (coordinators), which can act as a strong disincentive to apply
- The high barriers to entry to the FPs, due to the complexity of the rules, terminology, requirements, terms and conditions, and so on
- A lack of prioritisation of FP participation within Denmark up until relatively recently, which has meant that the drivers and rewards for FP participation (and for securing external / international funding more generally) have been relatively weak
- A lack of support available to assist applicants and participants in relation to the FPs, with other competitor countries having developed stronger and more comprehensive strategies and support measures to enhance participation earlier than has been the case in Denmark
- The high cost of carrying out research in Denmark, which may limit the extent to which Danish partners are sought out by other consortia across the EU.

The factors above, in combination, are likely to have led to a situation where FP participation is neither necessary nor particularly desirable as viewed from the perspective of large sections of the research community. However, it should not be forgotten that Danish participation in the FPs is still at a respectable level, so there are clearly still large sections of the community that recognise and value the benefits of FP participation and have continued to apply and participate in spite of the factors summarised above.

#### 5.4.3 Strategies to improve demand for FP participation

The problem of declining participation in the FPs has been recognised both by the Ministry of Science, Technology and Innovation and by individual institutions, and a wide range of strategies have been developed over the past few years to try to halt and reverse the decline.

The main strategies in place to increase demand for FP participation address in some way most if not all of the identified barriers to participation outlined above. The major actions that have been undertaken to strengthen demand for participation in the FPs are as follows:

- Very strong signals from the Ministry that FP participation should be prioritised
- Creation of the Reference Group mechanism to strengthen Danish inputs into and influence over the FP work programmes
- Strengthened EuroCenter, now internalised within the Ministry with more staff and a more comprehensive package of support available to both academic researchers and companies wishing to participate in the FPs
- Direct financial incentives to the universities based on the level of FP funding achieved (the REWARD initiative). There is also a fairly comprehensive body of financial grants to support participation by university researchers, mainly at the proposal development and contract negotiation stages. These are offered by the Ministry, the Research Councils and by some individual universities and are particularly focused on FP project coordinators

- Exploratory grants to SMEs to help them to participate in FP proposals
- Funding to support the creation of national and international networks
- Strengthened central support offices in the Danish universities, which now all have teams focused exclusively on (or specialising mainly in) supporting FP participation across all parts of the process
- Improved recognition and reward for FP participation within the university system, particularly for project coordinators and European Research Council (ERC) grant holders.

Both the EuroCenter and the universities' CSOs have been considerably developed and strengthened over the past few years, and they now provide very comprehensive packages of support to prospective participants as detailed in Section 4.3.5. Due to the extensive range of support on offer we will not repeat all of the actions here. However, they include training programmes, one-to-one support, and guidance in relation to all aspects of FP participation, including *inter alia* the identification of opportunities, formation of partnerships, proposal preparation and submission, contract negotiation and consortium agreements, project set-up, financial and administrative project management and reporting, auditing, and project closure. There is also considerable activity aimed at promoting the benefits of participation in order to encourage improved levels of demand for participation.

We received overwhelmingly positive feedback for users concerning the range and quality of the support on offer from the EuroCenter and university CSOs. The experience, knowledge and responsiveness of the individual support providers are clearly very good and there is a very high level of customer satisfaction among those using the services. It is also clear that the support is effective, helping to encourage higher levels of participations and success within the competition, and helping to ensure that projects coordinated by Danish researchers run as smoothly as possible.

We also received very positive feedback on the steps taken by the Ministry to promote, reward and support FP participation.

It is notable that despite the significant strengthening of the support on offer and efforts by the EuroCenter and university CSOs to advertise their services and activities to prospective participants, there remains a lack of understanding both of the benefits of participation and the nature and level of support available, and so more needs to be done to address what are now largely (though not exclusively) issues of awareness and perception.

We recommend that the EuroCenter and the major research performing institutions redouble their efforts to promote both the benefits of FP participation and the full range of support and assistance that is now available nationally and at institutional level.

While the measures now in place to support Danish participation in the FPs are both comprehensive and of a good quality, we did identify a number of areas where the support provision could be further strengthened.

The first area relates to the incentives for FP participation, and the fact that many researchers still feel that not enough is being done to ensure that FP participation is properly recognised and rewarded. The major issue is that national funding is still rather easier to obtain, and offers better 'terms and conditions' than FP funding, so the incentives for FP participation need to be as strong as possible to overcome what is felt to be a high level of 'inertia' in the system as regards participation in international collaborative programmes. There are no real pressures for Danish researchers to become more international in their outlook, and no real penalty for not doing so. Further removal of funding barriers to FP participation, and improved rewards and recognition for FP participation are felt to be necessary before Denmark will see a significant uplift in demand.

We therefore recommend that the Ministry and the Research Councils:

- Take steps to integrate FP participation as a significant ‘success criterion’ when assessing national funding proposals
- Improve the strategic alignment and complementarity between national research programmes and the FPs at both ‘topic’ levels and in terms of funding support
- Commit to retain the REWARD fund
- Ensure that researchers have more ‘automatic’ routes to covering the 25 per cent of FP project costs not covered by EC funding
- Ensure that all Research Councils recognise and provide active support for FP participation

It is also notable that SMEs do not enjoy the same level of access to financial support as universities and research institutes and so additional measures should be put in place to encourage and support their involvement. Some commentators have suggested that the EuroCenter should focus exclusively on supporting industrial participation, given that the universities have strengthened their ability to ‘serve themselves’ but we would not advocate such a step at this time. However, there does appear to be a strong case to ensure that measures to support SME involvement are strengthened.

We recommend that the Ministry (i) look for ways to provide increased recognition and reward to researchers that partner with Danish companies within their FP projects, and (ii) improve the package of financial and practical support available to SMEs.

Our interviews with the university central support offices identified a range of good practices in support provision, not all of which are in place in all parts of the system. While there are existing forums through which the university CSOs meet and share experiences and practice, it is clear that some of the support units within the universities have gone much further than others in terms of resolving known problems or finding new ways in which to assist participants. There is scope to undertake a more detailed review (than has been possible within this exercise) of the range of support on offer and the extent to which CSOs have been able to resolve known problems. Such an exercise, which could be spearheaded by the EuroCenter, should prove useful in helping to identify expertise that can be transferred between the universities in order to bolster their operations.

We recommend that further efforts are undertaken to share ‘best practice’ in FP support provision across the university sector, and that a more in-depth review is undertaken to identify and share effective practices and solutions in place within some universities and not others.

The university CSOs have gone a long way transferring the administrative burden of FP project management away from project leaders by taking on the role of financial and administrative project management themselves as part of a dedicated service. While these moves are undoubtedly helping to increase the propensity of researchers to coordinate projects, the overwhelming view across the community is that FP rules and associated administrative and financial reporting procedures are excessively complex and burdensome and not fit for purpose. It is also the case that different parts of the FP and other EU-level programmes have very different requirements, creating very large inefficiencies without adding any value to the research effort.

We recommend that the Ministry, in conjunction with other countries, lobby the Commission for a radical simplification of financial, administrative and reporting procedures ahead of FP8.

There is a collective sense within the research and industrial communities that Denmark is not particularly effective at promoting its research strengths internationally. Demand for participation in the FPs by Danish researchers and companies should come from outside as well as from within, and the more that Denmark can do to identify, package and promote its capabilities the higher the likelihood the FP participation levels will improve. There are also opportunities to improve partner searching and matching services, both inside Denmark and beyond, and for improving levels of understanding as to which parts of the Danish research system are taking a full and active in the FPs and which are not yet reaching their full potential. Moreover, while some universities have a good oversight of levels of demand for participation across their institutions and are able to undertake strategic assessments of where to target encouragement and support, other universities operate within a more decentralised environment and are currently unable to do this.

We recommend that efforts are made to develop a stronger mapping of Danish research strengths in both the public and private spheres, in order to (i) improve understanding of areas where Danish FP participation can be strengthened, (ii) improve partner-matching services, both within Denmark and across the EU, and (iii) improve promotion of Danish research capabilities.

## 5.5 Strategies for increasing FP proposal success rates

### 5.5.1 Danish success rates when applying to the FPs

Unfortunately data on Danish participation in proposals submitted to FP7 to date was not available in a form that allowed us to confidently work out the success rates achieved so far, so our analyses of Danish proposal success rates (and levels of demand) have had to be based on FP6 alone.

However, the data show very clearly that Danish success rates for FP6 proposals were well above average for the competition as a whole (23 per cent for proposals with Danish participation as compared to 18 per cent for all proposals). The data also show that Danish proposal success rates were above the FP6 averages in 14 of the 17 FP6 Priority Areas, and were particularly high in *Food quality and safety*, *Sustainable development*, *Science & society*, *Euratom*, *International cooperation*, *Policy support*, and *Coordination of activities*. Danish success rates were also above average in relation to most of the Instruments used to implement the FP6 priorities.

Based on these data we can conclude that Danish success rates when applying to the FPs are very good, overall and in most areas of the programme.

### 5.5.2 Strategies to improve Danish success rates within the FPs

The EuroCenter and university CSOs offer a comprehensive range of services to FP applicants to assist in the proposal preparation process and to ensure that applicants maximise their chances of success. These services have been outlined in brief in Section 4.3.5 and suggestions from participants as to how to maximise chances of success within the competition are presented in Section 4.4.3. Because success rates are already very high we do not have many suggestions for how the strategies and services can be improved, but there are a number of points of note.

First, the level of take-up of support for proposal development appears to be relatively low, and many of the CSOs indicated that they have to push hard to encourage applicants to use their services. Despite these efforts, many applicants elect to ‘go it alone’ and proceed to submit proposals without recourse to the assistance available from the support units. This may partly be due to a lack of awareness, and we have already recommended that promotional efforts are maintained and strengthened wherever possible.

Second, we have also noted that many of the universities have a very decentralised approach, with most placing no requirement on researchers to notify centrally their intention to submit proposals to the FPs. Within the universities that *do* have such a requirement in place, it is possible for the CSOs to advertise their support in a more targeted way, improving the likelihood that they will be able to intervene to help strengthen proposals before they are submitted. It also enables them to build up a strong understanding of where demand for participation is high / low across their institution, allowing them to target any promotional efforts more effectively. They are also able to understand relative success rates and determine more effectively why certain proposals have failed and others have been successful, enhancing the level and quality of advice that they are able to offer.

This is a concrete example of the variability in approaches across the universities, and an area where we believe greater adoption of good practice would pay dividends, particularly if success rates are to be maintained within a context of increased demand for participation.

We recommend that all universities take steps to require (or at least strongly encourage) their researchers to notify their intention to submit FP proposals so that the central support offices can provide more effective support to these applicants.

Finally, improved notification of intention to apply to the FPs offers the possibility for improved coordination of proposals within and, perhaps in time, across institutions. We have found that in some areas (e.g. Food) there is significant competition between and in some cases within institutions for funding under specific FP calls, and some commentators have argued that a more coordinated and strategic approach to the formation of partnerships could be effected if there was better understanding as to which FP calls the different research groups intend to respond to.

## 5.6 Strategies for enhancing FP project implementation

### 5.6.1 Danish roles within the FP projects

Our analyses have shown that Danish coordination rates were very slightly below the average levels in both FP6 and FP7, but this may be due to Denmark’s participation profile and in particular the fact that it has a relatively low involvement in the Marie Curie Actions where the coordination rates are highest. We have also shown that Danish funding levels per participation were above the average for FP6, suggesting that the Danish partners do occupy a fairly significant role within the partnerships. The responses to our questionnaire have also indicated that the majority of Danish participants have typically occupied either the ‘primary role’ or a ‘major role’ with regard to most aspects of the projects that they have been involved in.

### 5.6.2 Strategies to assist participants in managing their involvement in FP projects

Feedback from participants has identified a range of advice that they follow to help ensure that their participation in FP projects runs as smoothly as possible, detailed in Section 4.5.2.

We received mixed views as to whether it is more beneficial to occupy a central role in the projects or to act more in a ‘supplier’ role, with perhaps the most useful advice being that new or inexperienced participants should act as a partner first with perhaps a smaller role and that as experience

is built up participants should move on to become work package leaders before transitioning to becoming project coordinators.

The only major issues we identified in relation to the execution of FP projects concerned the very high administrative and reporting burden that falls particularly on project coordinators. The university CSOs are now providing a range of support designed to alleviate the administrative burden, and many are taking on the role of administrative and financial project management on behalf of the project leaders and this is clearly helping to improve the experience of FP participation among researchers and is helping to overcome some of the barriers to participation.

### 5.6.3 Areas where more could be done to assist Danish participation during FP projects

The trend towards professionalisation and ‘outsourcing’ of administrative and financial project management is in line with developments in other countries, and the universities appear to be doing a good job in this respect, expanding their competencies in this area and helping to free the researchers up to focus on the research. This is a trend that we believe is a positive one, although we reiterate our recommendation concerning the need to improve sharing of good practice across the university sector. Until such time as the Commission is able to significantly streamline and simplify its requirements it is likely that there will be a continued need for the CSOs to provide this kind of service, and it is at least positive that the costs involved can be claimed as part of the EC financing.

There is, however, a potential issue with regard to the level of support available for SMEs during the projects. It is not clear that SMEs enjoy the same level of support as their university counterparts, and while the EuroCenter is very good at encouraging participation and helping to explain how the whole process works, it is not clear that it is able to provide the same level of support to SMEs as can be assigned by the universities to

their own researchers. Danish industry participation rates are in line with the FP averages as a whole, but companies receive a far lower share of the funding than might be expected, given their level of participation. It is therefore possible that they are currently only undertaking minor roles in many of the projects due to the difficulties inherent in taking on more of a management role. It is likely that improved support in the area of financial and administrative management could help to strengthen their level of involvement and their role within the projects.

We recommend that the EuroCenter investigate ways in which to strengthen Danish companies’ roles in their FP projects, and that it undertakes to provide whatever support is needed to enable them to strengthen their role in the projects.

## 5.7 Benefits delivered through FP participation

### 5.7.1 Outputs and benefits delivered through FP projects

The main forms of output and benefit delivered through the FP projects are detailed in Section 4.6 of this report and so will not be repeated here. It should also be noted that the Appendix to this report provides more detailed account of the findings of our questionnaire of FP6 and FP7 participants and which explores in more detail the benefits realised through FP participation.

The main findings are that most of the outputs sought and produced through FP projects are research outputs (publications, conferences, trained personnel, etc.), and there is far less activity in relation to innovation outputs such as new products, patents, licenses and so on. This is to be expected given the pre-competitive nature of the research carried out within the FPs. It is notable, however, that a significant proportion of participants do rate innovation outputs as im-

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portant but the projects appear far more likely to deliver them at a level below expectations, while the research outputs are generally delivered in line with or above expectations.

With regards to the benefits of participation, a comparison of the motives and goals of the participants with the benefits actually realised indicates that FP projects do tend to deliver the kinds of impacts that the participants are seeking. The main positive benefits realised include new relationships and networks, increased understanding and knowledge, increased scientific and technological capabilities, and enhanced reputation and image. The vast majority of participants report medium-high impacts in each of these areas.

The benefits derived naturally revolve around the concept of 'collaboration' and participants confirm that FP participation is predominantly about exchange of knowledge and access to complementary capabilities, tools, methods, and so on. One of the major impacts of the FPs has been to increase the level of collaboration and networking between scientists and technologists at an EU-level, and based on our analyses we have estimated that during FP6 Danish participants were exposed to some 10,000 new partners, almost half of which are expected to endure in the future. This level of networking and partnership formation simply could not be achieved in the absence of the FPs.

We have established that more than two-thirds (68 per cent) of Danish FP6/7 participants have realised a positive benefit to cost ratio, with the remainder split between those who stated that the costs and benefits were evenly balanced, and those who stated that the costs of participation had outweighed the benefits. Those reporting a *negative* benefit to cost ratio pointed to problems associated with the high levels of administration and bureaucracy involved the limited amount of funding received, difficulties in securing co-funding to support their participation, and failure to achieve the scientific objectives of the projects. Those reporting a *positive* benefit to cost ratio pointed to the significant benefits realised from the collaboration, as already described above.

Figure 23 - Table of acronyms

Acronym	Full term
ASG	Administrative Support Groups
CA	Coordination Action
CLR	Collective Research Project
CRAFT	Co-operative Research Projects
CSO	Central Support Offices
DANRO	Danish EU Research Office
DARMA	Danish Association for Research Managers and Administrators
DASTI	Danish Agency for Science, Technology and Innovation
DG	Directorate General
DKK	Danish Krone
EC	European Commission
ERC	European Research Council
ETP	European Technology Platform
EU	European Union
FP	Framework Programme
GDP	Gross Domestic Product
GERD	Gross Expenditure on Research and Development
HEI	Higher Education Institution
HES	Higher Education Organisations
I3	Integrated Infrastructure Initiatives
ICT	Information and Communication Technologies
II	Specific Actions to Promote Research Infrastructures
IND	Industry Organisations
IP	Integrated Project
IPR	Intellectual Property Rights
JTI	Joint Technology Initiative
MCA	Marie-Curie Action
NCP	National Contact Point
NoE	Networks of Excellence
OTH	Other Organisations
PT	Production Technologies
R&D	Research and Development
R&I	Research and Innovation
REC	Research Organisations
RG	Reference Group
S&T	Science and Technology
SME	Small and Medium-sized Enterprise
SSA	Specific Support Action
STREPs	Specific Targeted Research Projects



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