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European Commission
Information Society and Media
Directorate-General

POPSIS

Pricing Of Public Sector Information Study

Summary Report

October 2011

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Acknowledgements

Many individuals and organizations have contributed to the success of this study. We wish to acknowledge some of the key contributors and thank them for their assistance.

First and foremost, we would like to thank the team's Project Officer, Mr. Juan Pelegrin, his Head of Unit Mr. Richard Swetenham and his unit in DG INFSO. In addition, special thanks are due to the many individuals who consented to give interviews and who responded to our questions. Finally, an expression of our gratitude is offered to Mr. Robbin te Velde, Mr. Raimondo Iemma and Mr. Graham Vickery who participated in the meeting validating our final draft report.

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The study was awarded in response to a request for services to undertake a study on the assessment of the different models of supply and charging for public sector information (SMART 2010/0046) under the Framework Contract Lot 2 DG INFSO SMART 2009/0042 to Deloitte Consulting CVBA located in Brussels, in cooperation with external experts.

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1 Executive summary

The public sector collects, creates, produces and disseminates a wide variety of information ranging from legal and administrative information, business and economic data, to geographic and meteorological information. Public sector information (PSI) constitutes a valuable raw material which can be re-used by third parties in added-value information products and services.

This **Pricing of PSI Study (POPSIS)** has assessed different **models of supply and charging for PSI** and their effects through the analysis of 21 case studies. The cases cover a wide range of public sector bodies (PSBs) and different PSI sectors (meteorological data, geographical data, business registries and others) across Europe. The study has also produced a snapshot of the **smartphone applications market based on PSI** and a comparative analysis of several **Open Data portals in Europe and beyond**.

(1) Results of the PSI charging case studies

The study examined the charging practices of 21 PSBs. These practices range from zero and marginal cost models to partial and full cost-recovery regimes. As laid out in the chart below, the case study analysis focuses on the effects of PSI charging models on the downstream market, PSI re-users and end-users and impacts on the PSB itself.

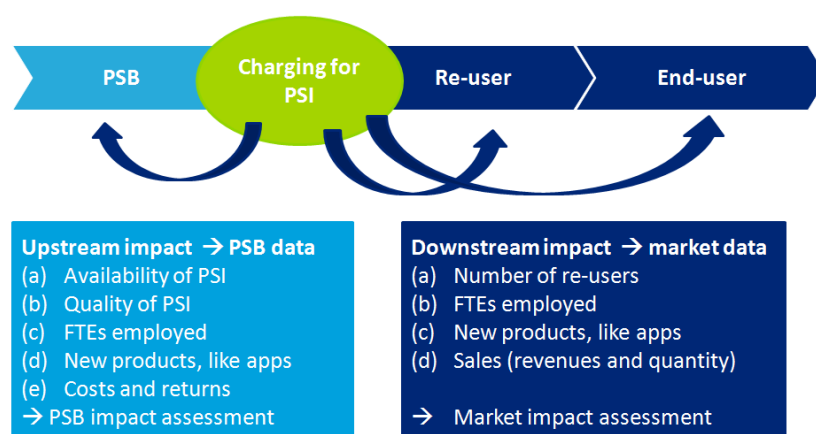


Figure 1: Upstream and downstream effects of PSI charging models

The study also identifies the main obstacles and enablers to effect change in PSI charging.

(a) Main findings from the PSI charging case studies

The case studies show a **clear trend towards lowering charges and/or facilitating re-use** (16 out of the 21 cases). Some PSBs only charge for commercial re-use and allow non-commercial re-use either against reduced fees (seven out of 21 cases) or for free (nine out of 21 cases). In almost all cases, PSBs allow free access to their PSI (i.e., viewing without copying). In some cases, free access has been the forerunner of a more flexible re-use regime.

In those case studies where cost-recovery regimes are applied, **the calculation basis for determining PSI re-use charges appears to be weak**. In discussions with interviewees, the PSBs' concerned were mostly unable to explain the basis for their PSI cost allocation. In some cases, the setting of charges seems to be oriented towards filling budgetary gaps rather than being geared to the cost-oriented tariff-setting required under the PSI Directive 2003/98/EC.

In all the case studies, the **PSI re-use revenues of PSBs** range from **relatively small to extremely small** when compared to the total budget of the PSB concerned. In half of the cases, these revenues constitute less than 1% of the PSBs' entire budget.

Based on their own raw data, the number of **PSBs that exploit added-value products is limited** (seven out of 21 cases) **and** appears to be **decreasing over time**.

(b) Downstream effects of lowered charges

In those cases where PSBs moved to marginal and zero cost charging or cost-recovery that is limited to re-use facilitation costs only, the **number of re-users increased by between 1,000% and 10,000%**.

Lowering charges may **attract new types of re-users, in particular SMEs**. This also applies to cases where the price cuts have been less significant (or even absent), but where **special pricing schemes for SMEs** were introduced.

(c) Upstream effects of lowered charges

All case studies where PSBs have lowered their prices demonstrate that demand volumes expand strongly (there have been increases of up to 7,000%). In some cases, **PSI sales revenues** can **remain stable or even increase after drastic price cuts** due to the growing demand. Of course, once charges are zero, revenues are also zero.

Costs appear to increase very little: in fact, they may eventually decrease if the volumes of re-use grow significantly. Once re-use facilitation processes are properly organized, they become sub-routines within the PSB. To a large extent, they become embedded in the PSB's public task-funded activities at no extra cost.

Zero cost pricing has the additional advantage that **transaction costs decrease** significantly. This decrease applies not only to administrative costs, such as invoicing, but also to costs related to the monitoring of compliance with license arrangements.

Several PSBs have reported that **intensified ties with re-users** may lead to **improved data quality and process efficiency** since any deficiencies in the data are promptly flagged up and reported back to the PSB. Hence, when the interest in data quality is shared, quality control is partly outsourced.

(d) Obstacles to change

A large majority of PSBs interviewed do not seem to have fundamental objections to lowering charges. Yet, **PSBs that rely on sales revenues from PSI** and their own value-added

products appear to be stuck in a situation of **deadlock**: although they are sympathetic to lowering charges and allowing more data re-use, their dependency on sales revenues compels them to protect their current revenue streams when there is no other sustainable alternative income stream available.

Such an **alternative income stream** can often only be provided by the Treasury, since the benefits from lowered charges are often concentrated in the form of increased tax gains. Thus, the **power to enable change** does **not necessarily** lie **with the Ministry willing to support the move**, let alone with the PSB concerned.

Further barriers to change relate to **statutory provisions imposing cost-recovery schemes**, the **legacy of old re-use regimes**, and the sheer **difficulty of changing existing practices**.

In addition, in several cases, **incumbent re-users** with considerable interests in the preservation of the status quo are trying to prevent PSBs from lowering charges in order to keep barriers to entry high. Some re-users are reported as **lobbying** actively and sometimes even **litigating to prevent PSBs from adopting lower charges**.

(e) Enablers of change

Change appears to be brought about both bottom-up and top-down.

In the cases of **bottom-up change**, PSBs that moved towards lower charges were often driven by the notion that **making data available and serving re-users** is part of their **core public task**. In many cases, the momentum was driven by inspired leaders in the PSBs who took action within the limitations of the existing framework. In most cases, where the movement was bottom-up, the business case was made upfront to **justify the reason for change**. The costs, the benefits and the financing of the transition process had to be shown clearly. Quite often, interviewees acknowledged that, ultimately, there was often a significant 'leap of faith'. However, the rationale for making such a leap was often harnessed after two aspects of potential **efficiency and effectiveness** were made clear: the fractional contribution of the re-use revenues and the gains to be achieved.

In other cases, the need for change was imposed **top-down** either through a clear political decision or occasionally by a policy move made by another PSB that possessed the same data. In these cases, the PSB's negotiating position was somewhat different. Often, the PSB managed to obtain a form of **compensation for its drop in income**: this was particularly the case where the revenues from its own exploitation were of some significance and entailed a reorganization process.

(f) Conclusions

The case study analysis indicates that the **potential benefits** of lowered charges for PSI re-use **can be high**. Lowered charges can lead to more economic activity, market dynamism, innovation and employment. They may also entail efficiency gains for the PSBs.

The **potential costs** of lowering PSI charges **appear to be low**. Unless zero cost pricing is applied, the price mechanism may actually increase the revenues rather than lowering them. The costs of a transition to lower PSI charges appear to be relatively low. This is

because, to a large extent, the knowledge and infrastructure needed by the PSBs already exist. The main effort lies in an adjustment of processes and mindsets to serve PSI re-users most effectively.

(2) The smartphone application market and PSI

The **market for mobile apps** has outgrown the information and communication technologies market over the past two years (2009-2010), and its growth will **accelerate** in the future **to reach \$ US 35 billion in 2015**. It is to be **one of the fastest growing segments** in the **information technology market**.

Apps present an interesting market opportunity because customers are more willing to pay for mobile apps than for web services. Sixty per cent of apps on European markets are developed by European developers. However, at present, the **average apps developer** makes only **\$ US 3 000 a year directly from apps sales**. There are **various experiments with alternative business models**: from freemium through to ad-based or subscription-based models. There are many start-ups that develop their apps mainly to generate visibility from venture capitalists. In the **short-term, no large profit nor employment impact is visible** (e.g., 80 per cent of paid Android apps were downloaded fewer than 100 times). It is, however, easy to foresee that the **picture will probably change dramatically** in no more than three years' time – which is what is attracting venture capitalists to the field.

Even if the most popular apps today are generally games, **PSI is used as the basis for a sizeable proportion of apps**, especially **weather, travel and transport** applications. Transport data in particular appear to be used as the single most important segment of the PSI-based apps market. Most success stories, such as the MetroParis and London Tube applications which have jointly generated 400,000 euros in revenues have used such transport data. While most PSI-based apps are free, developers expect there to be more **revenue opportunities** that emerge from apps that **integrate different data sources, more value added datasets and datasets which provide real-time data**.

The **key drivers of innovation** in the PSI-based apps market are **the availability of clear, similar re-use rules** and the **freedom to experiment with different business models** without **upfront costs**. The main barriers appear to lie in **competition** that comes from some **PSBs** that are creating their own free apps as well as **diverse pricing for different datasets**, an exceptionally **wide range of conditions for re-use** across the various European countries, and **unexpected changes in re-use conditions**.

(3) Open Data portals

In the last three years (2009-2011), the **number of Open Data Portals has grown at an increasingly rapid pace**. Today, the notion of an open data portal has become mainstream. This high-profile policy activity is being implemented by a range of government organizations as a key element of their different open government strategies.

There is a large **variability among supply, take-up and impact of Open Data Portals**. The datasets on portals vary in number from 6,200 to five, with huge differences in the type of data being made available. In the study's sample, the volume of datasets downloaded varies

from 320,000 to 250 per month. There are also occasional portals which function as directories rather than as repositories.

All portals make data available for free, in **most** cases using a **Creative Commons license**. The portals do **not determine direct changes in the pricing policy** for datasets, but they do **help to support a shift to PSI** that is distributed free or at marginal cost.

The portals' budgets vary considerable from the \$US 9.2 million so far spent on US data.gov to a hundred thousand euros on average allocated for European national and regional initiatives. The animation activities organized by most portals – such as apps competitions – continue to be popular among developers as the 430 entries to the recent Open Data Challenge (held in June 2011) show. The **largest data portal initiatives are, however, currently encountering funding problems** due to budgetary cuts. **Smaller initiatives are less affected.**

Open Data Portals appear to offer an important step in pushing forward the open data agenda and delivering its policy impact. Their **impact on opening up high added-value datasets is modest** and their **direct short term economic effects** have been so far limited. Their **largest impacts** to date are **indirect**: the portals stimulate **creativity and innovation** and **pave the way to unanticipated value creation**. In this context, a **“start small” approach appears to be most effective**. Open Data are an effective way to kick-start a process of cultural change that ultimately leads to the application of these high-level policy goals.

2 Introduction

This document is the POPSIS summary report which summarizes the key findings of the study. It covers all study objectives as outlined in the table below.

Table 1: Overview of the POPSIS study objectives

Objective	Details
A	An analysis of public sector bodies in the EU that have changed their charging policy vis-à-vis PSI. The purpose is to assess the impact of that change of policy on information producers and re-users.
B	An analysis of public sector bodies in three EU Member States that implement cost-recovery policies . The purpose is to assess the impacts of those policies on information producers and re-users.
C	An expansion of the case studies to research, assess and draw conclusions based on six specific domains of information: <ul style="list-style-type: none">• Cost benefit analysis;• Changes to data quality and availability;• Future costs;• Degree of competition in the market;• Expected levels of innovation;• Wider global experience of these trends.
D	Provision of a concise snapshot of the apps market which would include (i) an estimate of the number of apps based on PSI, and (ii) an examination and identification of the circumstances and conditions that the availability of PSI may have on apps development.
E	An identification of the key indicators to monitor the impact of PSI portal initiatives . On this basis, a measurement of the UK "data.gov.uk initiative" and a minimum of two similar initiatives in Europe. Consideration and comparison to be given to the experience of other countries (in particular the data.gov.us). An overall identification of the critical success factors for a dat.gov initiatives (including in relation to charging policies).

A detailed description of the POPSIS methodology, the full analysis and the annexes including the complete case studies can be found in the separate POPSIS final reports:

- POPSIS final report (ABC): Models of Supply and Charging for PSI
- POPSIS final report (D): Apps market snapshot
- POPSIS final report (E): Open Data portals

This report is structured as follows:

Firstly, the introduction in chapter 2 provides an overview of the POPSIS study objectives and the structure of this POPSIS summary report.

Secondly, chapter 3 presents the findings under the POPSIS study objectives ABC on different models for supply and charging for PSI.

Thirdly, chapter 4 lays out the main results obtained under POPSIS study objective D on the smartphone application market and PSI.

Fourthly, chapter 5 lays out the main results obtained under POPSIS study objective E on Open Data portals.

3 Models for supply and charging for PSI (ABC)

This chapter lays out the analysis of the different models for supply and charging for PSI, including the principal findings from the 21 case studies, main conclusions and trends observed. It is structured as follows:

Section 3.1 introduces the background to this study and defines the PSI charging models applied in this report.

Section 3.2 provides a comprehensive cross-analysis of the 21 case studies undertaken in the POPSIS study accompanied by a series of snapshots. First, an aggregated overview of the effects of different PSI charging policies at a general level is provided (sub-section 3.2.1). Then, the effects are analyzed more specifically at the level of the PSI domains, namely geographical information, meteorological information, business register information and other forms of information (sub-section 3.2.2). Finally, the specific economic effects of lowered PSI re-use charges are analyzed (sub-section 3.2.3). As a short digression, section 3.2.4 presents PSI charging policies and their effects in the US and Australia that allows some comparisons to be made with the European context. Sub-section 3.2.5 offers some concluding remarks.

Section 3.3 looks at the reasons, enablers and obstacles for policy change with regard to PSI charging models. First, the obstacles to PSI pricing policy change are analyzed (sub-section 3.3.1). Then, elements that may help to overcome any obstacles to policy change are discussed (sub-section 3.3.2). A number of "What if?" scenarios are also explored. Sub-section 3.3.3 offers a number of concluding observations.

3.1 Introduction

This study is based on a number of general developments that are taking place currently in the field of PSI re-use in Europe. PSI is increasingly acknowledged to be a driving European resource for new information products and services. The question of which charging model is applied by PSBs is key, and it remains politically sensitive due to its potential budgetary impact on the PSB concerned. More evidence with regard to the effects of the different charging models applied is sought by the PSBs, policy-makers, and the European Commission. This study will feed into this debate by providing facts and figures to stakeholders to supply evidence on the various advantages and disadvantages of different PSI charging regimes. This report is based on evidence gathered from 21 in-depth case studies of PSBs across Europe.

PSI is increasingly acknowledged as a driving European resource for new information products and services

PSBs collect, create, produce and disseminate a wide variety of information: this ranges from legal and administrative information, business and economic data, to cadastral and meteorological information. The advent of new information and communication technologies (ICTs) enables governments to act as key players in the knowledge-based

society as a result of their wide diffusion of PSI. PSI is a valuable 'raw material' which can be re-used by third parties in added-value information products and services.¹

Over the last years there is an increased positive engagement in PSI on the part of policy-makers and a willingness to make PSI more widely available and re-usable in Europe. For example, the United Kingdom (UK)'s initiative on opening up government data – www.data.gov.uk – was a first important milestone. It has been followed by a succession of other initiatives at European Union (EU), national, regional and sectoral levels. For instance, at municipal level, the cities of Berlin, London and Rennes have decided to open up their PSI to developers. This move was supported by the *Visby*² and *Malmö Ministerial Declarations*³ and the *Digital Agenda for Europe*⁴. These documents clearly recognize the economic potential of PSI re-use, notably with regard to the development of content markets, and call on Member States to make data freely accessible in open machine-readable formats in order to benefit entrepreneurship, research and transparency.

Charging for PSI by PSBs is key, but politically sensitive due to its potential budgetary impact

Even before the adoption of the PSI Directive,⁵ there was a lengthy debate between re-users, PSBs, policy-makers and academia, about what model of supply and charging for PSI would facilitate its greatest re-use and maximize its social and economic value. This discussion was sparked by the landmark studies of Peter Weiss⁶. In the latter half of the last decade, the debate was intensified considerably by the publication of a large number of studies and reports (most prominently: Nilsen (2007), OECD (2008), Newbery (2008), Pettifer (2008), Pollock (2009), Uhlir (2009) and Pénin (2011)). Most of these reports conclude that either zero cost charging or a marginal cost regime for certain sets of PSI result in social and economic benefits which may outweigh the immediate short-term financial benefits attained by cost-recovery strategies.⁷

There is still an ongoing and controversial debate regarding the manner in which PSBs should make their information publicly available. It includes whether it is appropriate to implement cost-recovery policies and to use PSI as an income-generating source. Some writers argue that charging either no or marginal costs for PSI has the result of social and economic benefits that far exceed the immediate financial benefits gained by cost-recovery

¹ Cf. European Commission (2009): *Re-use of Public Sector Information – Review of Directive 2003/98/EC*, COM(2009) 212 final and SEC(2009) 597.

² Creating impact for an eUnion 2015 – The Visby Declaration, 10 November 2009.

³ Ministerial Declaration on eGovernment, 18 November 2009.

⁴ European Commission (2010): *A Digital Agenda for Europe*, COM(2010) 245 final/2.

⁵ Directive 2003/98/EC of the European Parliament and of the Council of 17 November 2003 on the re-use of public sector information, OJ L 345, pp. 90-96.

⁶ Weiss (2002): *Borders in Cyberspace: Conflicting Public Sector Information Policies*, U. S. Department of Commerce and their Economic Impacts NOAA, National Weather Service.

⁷ Cf. inter alia: Weiss (2002): *Borders in Cyberspace: Conflicting Public Sector Information Policies*; Nilsen (2007): *Economic theory as it applies to statistics Canada: a review of literature*; OECD (2008): *Recommendation of the Council for Enhanced Access and More Effective Use of Public Sector Information*; Newbery et. al. (2008): *Models of Public Sector Information Provision via Trading Funds*; Paul F. Uhlir (2009): *The Socioeconomic Effects of Public Sector Information on Digital Networks*; Pettifer (2009): *PSI in European Meteorology – an unfulfilled potential*; Pollock (2009): *The Economics of Public Sector Information*; Pénin et.al (2011): *La valorisation des informations du secteur public (ISP): un modèle économique de tarification optimal*.

strategies. Others question the permanent sustainability of a scheme providing PSI at no or marginal prices when the costs of creating and maintaining quality PSI can be substantial (and thus require additional public funding).⁸

The sensitivity of the issue of charging for re-use is also reflected in the European Commission 2010 public consultation on the PSI Directive⁹ which produced a considerable number of responses (n=585). The public consultation results acknowledge that a majority of respondents disagrees with cost-recovery policies and strongly agrees with the free provision of PSI for non-commercial re-use. However, there is no clear preference of the respondents for a single form of charging model. The figure below indicates the responses to the 2010 public consultation on the PSI Directive with regard to charging.

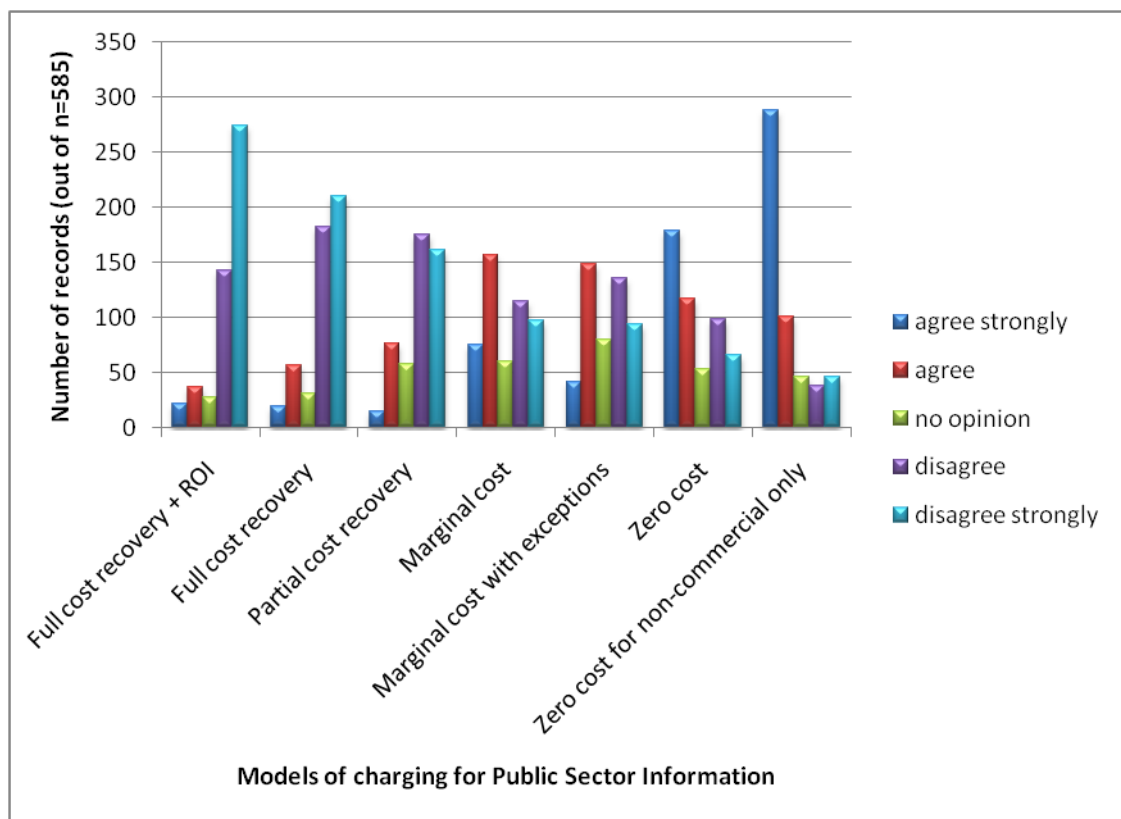


Figure 2: Responses to the European Commission public consultation on the PSI Directive (2010)

⁸ Cf. European Commission (2009): *Re-use of Public Sector Information – Review of Directive 2003/98/EC – Staff working paper*, SEC(2009) 597, p. 19.

⁹ Cf. European Commission (2011): *Results of the online consultation of stakeholders "Review of the PSI Directive"*, 67 pp.

Charging models applied in this study

The 2009 Cambridge study¹⁰ was based on three charging regimes. The POPSIS study team adopted these definitions. However, it added a further subcategory of definition: ‘re-use facilitation cost-recovery’.

Profit-maximization

“Setting a price to maximize profit given the demand faced by the PSB. Where the product being supplied does not face competition then this will naturally result in monopoly pricing.”

Cost-recovery

“Setting a price equal to average long-run costs (including, for example, all fixed costs related to data production).”

The charging policy whereby only the costs related to the facilitation of re-use are charged (**‘re-use facilitation cost-recovery’**) is part of the cost-recovery model, but is at the very low end of the spectrum. It only includes costs that can truly be allocated to the re-users, for instance, the salary costs of the help desk. Thus, this approach does not imply that any costs are incurred in the framework of the public task or own re-use activities by the PSB itself.

Marginal costs and zero costs

“Setting a price equal to the short run marginal cost of supplying data”, that is, the cost of supplying data to an extra user. When considering digital data, this cost is essentially zero and marginal cost and zero cost pricing are identical.

Current EU rules allow for cost-recovery, but favour marginal cost pricing

The EU-level regulatory framework – the PSI Directive 2003/98/EC – fosters marginal cost pricing regimes for PSI although it also allows PSBs to fully recover their costs (including making a reasonable return on investment (ROI)). Indeed, recital 14 of the PSI Directive encourages Member States to stimulate their PSBs to make documents available at charges that do not exceed the marginal costs for reproduction and dissemination of the documents. However, article 6 gives PSBs the right to charge for their PSI, thereby generating an income that should not exceed the cost of collection, production, reproduction and dissemination, together with a reasonable ROI. The more general competition law framework under the Treaty on the Functioning of the European Union (TFEU) appears not to limit this position further (with the exception that a PSB's charging conduct could be regarded as a clear abuse of a position of dominance).

Increasing numbers of open data portal initiatives, popularity of apps contests and exponential growth of apps market

The Open Data Movement and the increasing number of initiatives of data.gov portals illustrate the public interest in PSI re-use. The apps market (including the PSI-based apps) is growing exponentially (it is expected to reach 35 billion US dollars in 2015). The success of apps contests (in terms of the numbers of entries and votes) indicate both the market and

¹⁰ Pollock (2009): *The Economics of Public Sector Information*.

social benefits of free data re-use. In addition, the opening up of data stocks that are currently not available to re-users may further increase the existing benefits.

More evidence on impact of charging is sought by the European Commission

After the first review of the PSI Directive, undertaken in 2009, the European Commission concluded that more evidence on the impact, effects and application of the Directive was to be gathered (including the effects of charging). A second review of the Directive is to take place in 2012. There is an enhanced interest in this matter which is driven by increasingly active re-users, the widely emerging Open Data movement, the growth in data.gov portals and the political acknowledgement of the socio-economic potential of PSI. In order to obtain more evidence on the impact of the various models of supply and charging for PSI, the European Commission commissioned the present study.

POPSIS supports the debate through the provision of evidence

This study aims to support the general debate and to provide evidence that can add to possible further European and national policy measures on PSI charging models. It reports on 21 in-depth PSB-based case studies across Europe. The case studies were undertaken by looking at the different charging models operated by PSBs with the intention of associating the models with their effects on the value chain. The models range from zero cost and partial cost-recovery to market pricing.

Typically, the value chain effects relate to both downstream and upstream indicators. The downstream indicators include the number of re-users, intensity of usage, level of innovation, sectoral turnover, employment and tax returns. The impacts of changes to the charging models also affect the PSBs providing the data. These changes include data quality, data availability, the development of internal cost structures and financing models.

The study's focus was on those sectors where PSI is an essential element or a substantial proportion of the value proposition. The cases explored include PSBs in the meteorological sector, the geographic information sector and the business information sector. The decision was made not to attempt to investigate cases that covered the entirety of the European territory. Rather, emphasis was placed on examining PSBs in those Member States which have potentially substantial re-use markets, and PSBs where policy changes on PSI re-use have taken place in recent times. The data produced by the case study evidence is both quantitative and qualitative.

3.2 Case studies and the effects

The various effects of the PSI charging policies are investigated here.

3.2.1 Overall picture of the effects of charging policies

The PSI re-use market is in a state of flux. Therefore, this sub-section first looks at the general trends and movements in the downstream market structure. As a second step, the main general observations from the 21 POPSIS case studies with regard to the effects of PSI charging policies are presented. Sub-section 3.2.2 then takes a closer look at the individual case studies clustered by PSI sectors.

(1) Market structure and economic effects

Distinction between high-end and low-end markets

First of all, it is essential to make a distinction between what can be considered the ‘high-end market’ and the ‘low-end market’, as the visible effects of both differ fundamentally.

The high-end market typically consists of re-users that provide their PSI-based services to professional clients. Substantial value is added by re-users serving the needs of specific clients. The re-users are largely knowledge-driven. Their revenue comes from a set of consumers. A typical example is a meteorological company that provides very detailed weather forecasts to oil rigs, based on its own high-tech forecast models. The high-end market services are highly targeted, the number of clients is relatively low and yet the value of each transaction is high.

The low-end market has different features. In the low-end market, the re-users are typically content-driven. The value-added is rather low. The business model of these re-users is based on their reach to large volumes of consumers (who are generally non-professional customers) who use high traffic web services and apps on mobile applications. Typically, these re-users merely mash up the PSI with other free content and integrate it into services. A typical example of such a re-user is a provider of ‘of the moment’ content: this re-user provides the latest details on traffic, expected rain showers (through moving radar images) and news headlines. The re-users’ revenues come from third-party advertisements.

The table and figure below compare these two fundamentally different markets.¹¹

Table 2: High-end compared to low-end market re-users

Aspect	High-end market re-user	Low end-market re-user
Role of PSI in service delivered	Core	Part of a service
Value-added to PSI	High, based on strong knowhow	Low to zero
Type of clients	Professional	Consumers
Number of clients	Low	Very high
Business model	Targeted tailor-made services with high added-value (high price, low quantity)	Standardized end-user services with low added-value (low or zero price, high quantity)

¹¹ Both the MEPSIR and the 2006 OECD study make the same distinction. The OECD study refers to PSI knowledge (the high-end market) and PSI content (the low-end market). OECD, Working Party on the Information Economy, *Digital Broadband Content: Public Sector Information and Content*, 2006, pp. 10-17 and MEPSIR, *Measuring European Public Sector Information Resources, Final Report of Study on Exploitation of public sector information – benchmarking of EU framework conditions*, pp. 45-47 (2006).

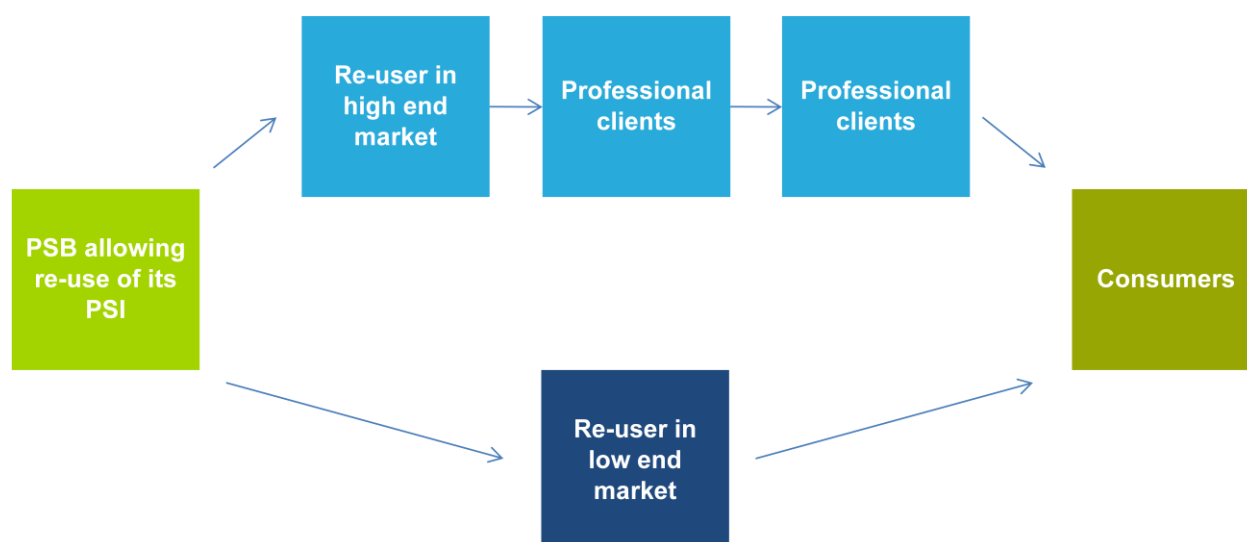


Figure 3: High-end and low-end re-use markets

The low-end market generates large consumer surplus and indirect economic benefits

Typically, discussions around the benefits of PSI re-use identify two types of outcomes: direct economic benefits that stem from growth and jobs in the re-use sectors, and indirect social benefits related to transparency and increased accountability. Following te Velde (2009)¹², the POPSIS study team argues that this polarization ignores an important component: indirect economic benefits that apply to society as a whole. Overlooking this benefit by focusing purely on the market size of re-use could lead to inappropriate decision-making, in particular if the decision-makers fail to consider the possible consumer surplus. In this case, the term 'consumer' refers to the end-users of PSI, including both business and consumer markets.

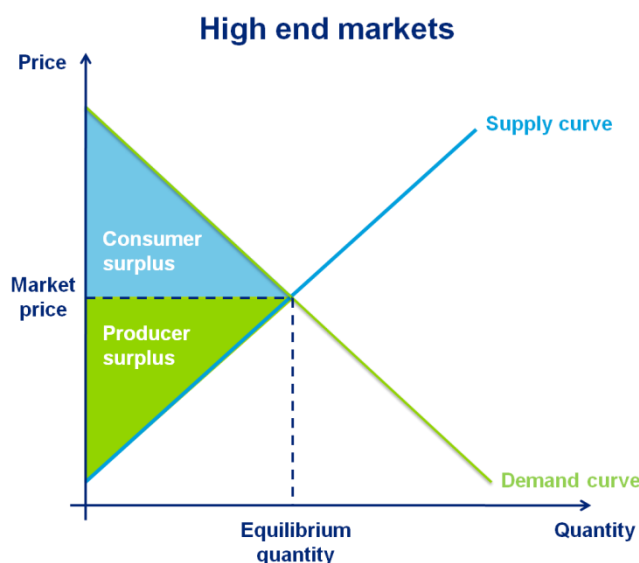
In fact, the market size of re-users could be reduced by lowering prices of PSI. Highly priced PSI creates barriers to entry for new players, thereby limiting competition between re-users, and keeping prices artificially high. High revenues for re-users could reflect market inefficiencies, so that end-users are forced to pay high prices for services that add little value to raw PSI. In this case, lowering the price of PSI would decrease the market size of the re-use market. However, it could transfer benefits to end-users in terms of consumer surplus.

Consumer surplus in high-end and low-end PSI markets

In economics, the consumer surplus is defined as the monetary gain obtained by consumers when they are able to purchase a product or service for a price that is less than the highest price that they would be willing to pay. Conversely, the producer surplus is the amount that producers benefit by selling at a market price that is higher than the least price at which they would be willing to sell.

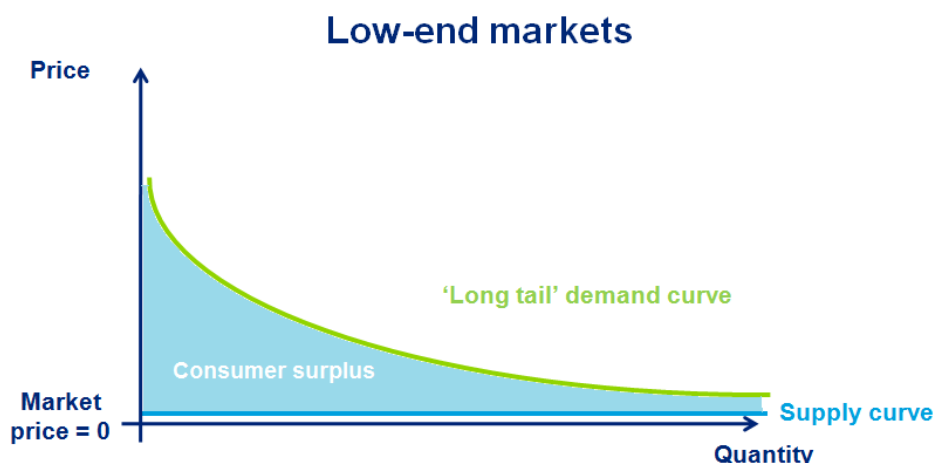
¹² Cf. te Velde, R. (2009): *Public Sector Information: Why Bother?*, in: Uhler, P. (2009), *The Socioeconomic Effects of Public Sector Information on Digital Networks: Toward a Better Understanding of Different Access and Reuse Policies: Workshop Summary*, pp. 25-28.

The graph below provides a simplified representation of a high-end PSI market. The high-end market re-users ('producers') sell their products at market prices to professional clients ('consumers'). This 'classical' market situation generates both a consumer and a producer surplus.



If the PSB that is providing PSI to the re-users in this high-end market were to lower its PSI raw data prices, it would have the effect of shifting the producers' supply curve downwards: the price for input decreases. Typically, the market price in the high-end market would decrease and the equilibrium quantity and consumer surplus would increase.

A reduction of PSI raw data prices by the PSB may also trigger the creation of a new low-end PSI market with other market players: on the one hand, there are low-end market re-users ('producers') with new business models and, on the other hand, end-consumers ('consumers'). The graph below provides a simplified illustration of a PSI low-end market.



Indeed, the reduction of PSI raw data prices reduces barriers to entry for new types of re-users, thus allowing the entrance of low-end re-users. The low-end market re-users have a different business model than re-users in the high-end market. Typically, they generate their income from advertising revenues rather than from sales of services. In order to maximize the revenues from advertising, they need to maximize the number of users ('consumers') of

their services, i.e. the audience. Therefore, low-end market re-users provide their services free of charge (or at very low prices) via the internet or mobile apps. Even though this low-end market does not generate any or little turnover from sales, it may yet produce a significant consumer surplus.

The argument about consumer surplus is particularly valid in the context of information-based services which are mostly web-based. Much information is available on the web for free, and consumers are accustomed not to pay for it. Prices do not reflect the value of information. A recent study by McKinsey (2011),¹³ based on a survey of consumer 'willingness to pay', attribute to the internet an annual consumer surplus of about 100 billion EUR worldwide.

A number of observations about the value of data and consumer surplus follow.

Firstly, it is possible that the wider economic impact and consumer surplus of PSI are not fully captured in very dynamic environments where prices and direct revenues do not reflect economic value. This study confirms the importance of accounting not only for direct sales revenues, but also for the larger consumer surplus. For instance, the increased availability of raw data and value-added data provided for free by PSBs has in some cases (such as that of the Italian Cadastre) reduced the market of re-users. It appears that some of the services that were most affected were simply 're-publishing' basic information with very little added-value and high mark-ups. The consumer surplus was therefore limited. Release of raw data and value-added data by the PSB increased consumer surplus while reducing the market for re-users. While this is not conclusive evidence to illustrate that reduced markets may increase consumer surplus, it does show that market size by itself is not a sign of economic efficiency and societal welfare.

Secondly, apps such as Metro Paris have provided a one-off direct revenue of 400K EUR to developers. If a conservative estimate of one hour saved in transport times is allotted per year to each app user (who earns an average wage of 20 EUR per hour), a total savings of 8 million EUR can be calculated. In this case, the consumer surplus each year is 20 times higher than the one-off direct revenue for a re-user.

Similarly, te Velde (2009)¹⁴ points out how raw low-resolution datasets from the Dutch Meteorological Office are used by a web service to provide real-time images of the sky that enable users to avoid rain showers when cycling. While this service is free, it provides substantial consumer surplus to its final users in terms of the value that can be attributed to 'not getting wet' while cycling home.

Thirdly, several interviewees confirmed that the greatest economic benefit was expected from the overall economic efficiency. For example, the dataset that is downloaded most

¹³ McKinsey Global Institute (2011): *Internet matters: The Net's sweeping impact on growth, jobs, and prosperity*, 56 pp.

¹⁴ Cf. te Velde, R. (2009): *Public Sector Information: Why Bother?*, in: Uhler, P. (2009), *The Socioeconomic Effects of Public Sector Information on Digital Networks: Toward a Better Understanding of Different Access and Reuse Policies: Workshop Summary*, pp. 25-28.

often from the Basque Country's data.gov portal is the calendar of public holidays by city. This is particularly used by companies in order to plan their internal work organization: as the data are released for free, the direct impact is nil. However, the simple fact that this is one of the most downloaded datasets is an index of its usefulness. This economic efficiency impact is not captured by a PSI re-use market impact.

It is certainly challenging to quantify these kinds of economic benefits as has been done in other contexts, such as the US Clean Air Act.¹⁵ One of the main challenges, in the case of PSI, is that the re-use of PSI is often unpredictable. It therefore limits the possibility to capture and model intangibles very precisely. What is certain is that:

- Consumer surplus and indirect economic impacts are substantial, and are often far higher than the direct revenues and jobs created;
- There is a potential trade-off between re-users' revenues and consumer surplus;
- Not taking consumer surplus and indirect impact into account would lead to a misrepresentation of the actual economic impact of any PSI pricing modification.

Greatest economic impact is only visible in the medium-term to long-term

Firstly, when considering the direct economic impact in terms of re-use growth, a medium-term or long-term view should be taken. Simply lowering PSI pricing does not lead automatically to growth of the re-use market. It is well recognized that innovation is not linear but systemic, and flourishes when different systemic components are in place. Reducing the cost of PSI is one component that removes a barrier to innovation, but it is not a sufficient factor on its own.

Secondly, even when innovative services are launched, they are not by definition profitable in the short-term. One of the most successful apps, MyCityWay, has been downloaded 40 million times but has not become profitable: instead, venture capitalists are investing millions of US dollars in the application in order to keep it growing, while a sustainable business model has yet to be defined. There is yet another example of how the early availability of public facilities can enable disruptive innovation even after a long time span. On a related matter, Tim O'Reilly provocatively stated that "Ronald Reagan is the father of Foursquare", attributing the recent success of the game-based app to the early liberalization of global positioning satellite (GPS) data in the 1980s. Focusing on only short-term impact would reflect the attitude of a short-sighted venture capitalist who might concentrate solely on an early exit strategy rather than on the pursuit of long-term growth.

Thirdly, disruptive innovation is unpredictable and non-linear: it has to reach a certain critical mass before it occurs, and it is far from evenly distributed among the different players involved. The distribution of downloads and revenues from the most successful apps follows a power-law distribution: some apps are exceptionally successful, generating millions of downloads and revenues, while the vast majority are unsuccessful. Some datasets are downloaded far more than others: the most downloaded dataset on the data.gov portal has been downloaded three times the amount of the second, which is double the third and so on. Similarly, the impact of pricing changes should not be expected to be linear and directly proportional to re-use increase: it is far more likely that a certain

¹⁵ Cf. <http://www.epa.gov/air/caa/>.

critical mass of data has to become available before substantial impacts are visible. In this sense, a piecemeal approach to PSI pricing based on market conditions could prove to be inappropriate in terms of any desire to stimulate the emergence of innovative services.

(2) Observations from the case studies on effects of PSI charging policies

Movement in the value chain

Both high-end and low-end markets have been explored in the 21 POPSIS case studies.

There are two trends. In a large majority of the case studies, especially in low-end markets, PSBs reassess their public task, take a step forward in the value chain and start to deliver their content directly to consumers. However, in yet another trend, PSBs drop the distinction between serving low-end and high-end markets, and stop any differentiation between commercial and non-commercial re-use. These PSBs simply open up all PSI both in raw data format (such as alphanumerical readings of weather stations) and translated formats (for example, weather forecasts) for any users that would like to avail themselves of the data. Examples of this second approach include the Norwegian Meteorological Office and the Spanish Cadastre cases.

There is a clear trend to lower charges

The case studies show a clear trend towards lowering charges and/or facilitating re-use by commercial and/or non-commercial re-users (in 16 out of the 21 case studies). This change took place largely within the last decade, mostly since 2005. The table below indicates those PSBs which are currently undertaking the largest shifts in changing their approach:

Table 3: Largest price cuts of PSBs under scope

Case study	% cut of re-use charges
Met.no	100% price cut
Destatis	100% price cut
Spanish Cadastre	100% price cut
BEV	Up to 97 % price cuts
French Cadastre	Up to 97% price cuts
ARSO	95% (to be implemented) price cuts
KNMI	80% price cut

Free access in almost all cases

Almost all the case studies show that over the last years PSBs have moved to providing free access to citizens (i.e. viewing, not downloading). In this sense, free access seems to act as the forerunner of a more liberal re-use regime. Examples include the IGN-CNIG and Spanish Cadastre cases.

Free non-commercial re-use

There are a quite a number of case studies that appear to be in an ‘in between’ situation, where non-commercial re-use is allowed against zero costs (and there is a charge only for

commercial re-use). This is, for instance, at least partially applied in seven cases that fall under the scope of this study: BKG, CENDOJ, DWD, DILA, IGN-CNIG, SenStadt, and the Slovenian Met Office.

Lowered charges often accompanied by further re-use facilitation measures

In those cases where PSBs have shifted to a lower charging regime, this movement is often accompanied by further policy measures to facilitate re-use. Such measures include the clarification of intellectual property rights, the reduction of administrative burden for licensing and invoicing (e.g. online one-click-licenses and e-payment) and the decision of the PSB to no longer provide its own added-value products on the market. The three most prominent cases that illustrate this trend are Destatis, KNMI and the Spanish Cadastre.

Charging regimes often appear to lack a basis

In those case studies where cost-recovery regimes are applied, the calculation basis for determining PSI re-use charges appears to be weak. The PSBs concerned were mostly unable to explain the basis for their PSI cost allocation. For example, they could not reply to such questions as: how many FTEs are in fact committed to re-use facilitation, what are the distribution costs, what is the return on investment and what is the eventual mark up. In some cases, the setting of charges seems to be oriented towards filling budgetary gaps rather than the more cost-oriented tariff setting which is required under the PSI Directive 2003/98/EC. Furthermore, sometimes the charges for re-use have remained the same for many years, even though the number of re-users has changed significantly: two examples of such a situation include the CENDOJ and the Dutch Cadastre's topographical map.

Moreover, when examining charging regimes, some PSBs apply a unit price that is reasonable for a single unit, but not for the entire database. As a consequence, the total price of the full dataset is prohibitive. For instance, the full database of the CENDOJ would cost 3.4 M EUR, although one unit of data (i.e. a single sentence) could be affordable at 1.5 EUR. The same circumstance is applied to the former charging regime of the French Cadastre in which the entire digital map would have cost a re-user 5.7 M EUR (whereas the price of a single map was 9.5 EUR). Therefore, despite interest on the part of re-users, no whole dataset was ever bought from the cadastre.

No or lower charging turns into outcome rather than input

Conversely, those PSBs that have established a re-use policy based on re-use facilitation charges are fully able to allocate the costs precisely. They have implemented mechanisms that allow for regular review of charging – quite often in the form of informal meetings with their re-users (examples include BEV, DECA and KNMI). In these cases, charging has become a consequence rather than an instrument.

No or lower charging as an instrument to stimulate market entry

Interestingly, some case studies demonstrate the use of variable pricing regimes such as 'pay per use' or 'percentage of turnover generated by PSI' without high fixed price elements. These regimes have led to increased re-use and facilitate new entrance of re-users, notably SMEs. The DILA case demonstrates this, since it plans to introduce a pay per use pricing scheme which will enable small potential re-users to benefit: this means that they are no longer obliged to buy a license for the full dataset if they do not need to do so.

This approach lowers entry barriers, and allows for customized data purchase. Other relevant case examples are: CENDOJ (pay per use), DWD (SME rebates), German geo-information PSBs (turnover-related fees) and IGN-CNIG (turnover-related fees).

Buienradar service enters market due to lowered KNMI PSI charges

As a consequence of the price cuts by the Dutch Meteorological Office KNMI, a new re-user entered the market and launched an innovative service under the name 'Rainfall Radar' (Buienradar). Anyone can use the service to determine whether it is going to rain in the current location over the next few hours. This service is provided completely free of charge. It generated around 300 million hits per year throughout Europe in 2010. Attracted by this high traffic, the service has been of keen interest to advertisers and is paid for through advertising revenues.

StormGeo goes international due to lowered ECMWF PSI charges

The shortcomings of the Norwegian (re-use) policy on meteo data before 2007 stimulated StormGeo to revise its strategy on running its own mid-ranking and fine-scale model simulations. As a result, it could benefit from the changes in the ECMWF re-use policy: re-use prices were lowered by over 60% (in 2002 the full dataset cost 365,000 EUR whereas by the end of 2004 the charges were 140,000 EUR). As a consequence, the quality of model data was enhanced. This allowed StormGeo to compete with former national meteorological offices in other parts of Europe and led to an increase in business and employment by 300% and 200% respectively.

Convolutd discussions hamper policy-making

During the course of the interviews performed in this study, it occasionally became apparent that knowledge was sometimes limited with regard to the application of the PSI Directive (including the proposed charging regimes). In particular, the public task – which demarcates the scope of the Directive to a large extent – and the concept of re-use were issues of some debate. This lack of clarity and inherent ambiguity does not contribute to clear policy-making or price-setting.

Cost-recovery percentages are relatively low

Interestingly, in all case studies, the PSI private sector re-use-related revenues of PSBs¹⁶ range from relatively small to extremely small when compared to the full budget of the PSB concerned. The table below provides an overview of these cost-recovery ratios which it lists alphabetically according to the various business sectors: e.g. business register, geographic information, meteorological information and legal information.

The cost-recovery ratio is defined as follows:

$$\text{Cost recovery ratio} = \frac{\text{Revenues from private sector PSI raw data sales}}{\text{Total budget of the PSB}} * 100\%$$

¹⁶ Where possible the cost-recovery ratio is calculated based on private sector re-use revenues only. However, in many cases PSBs do not distinguish between private and public sector PSI sales revenues. In these cases the cost-recovery ratio is calculated based on the total PSI sales revenues.

Table 4: Cost-recovery ratios of the PSBs under scope

Country	Public sector body	Sector	Cost-recovery ratio
IT	Infocamere	Business register	31.31%
NL	KvK	Business register	19.50%
UK	Companies House	Business register	20.73%
AT	BEV	Geographic information	< 26.5%
DE	BKG	Geographic information	0.24%
DE	SenStadt	Geographic information	10.38%
DK	DECA	Geographic information	0.82%
ES	IGN-CENIG	Geographic information	4.12%
ES	Spanish Cadastre	Geographic information	0.00%
FR	French cadastre	Geographic information	0.55%
IT	Italian cadastre	Geographic information	0.50%
NL	Dutch cadastre	Geographic information	6.57%
UK	Ordnance Survey	Geographic information	16.54%
DE	DWD	Meteorological information	0.93%
NL	KNMI	Meteorological information	0.45%
NO	Met.no	Meteorological information	0.00%
SI	ARSO	Meteorological information	6.00%
ES	CENDOJ	Legal information	16.67%
FR	DILA	Legal information	0.67%
FR	SIRCOM	Fuel prices information	15.91%
DE	DeStatis	Statistical information	0.11%

3.2.2 Overview of effects of charging policies in the 21 case studies

This sub-section presents the main figures and insights from the 21 POPSIS case studies. For the purposes of clarity, they have been clustered into the four different PSI domains that come under the study's scope: geographic information, meteorological information, business register information and other PSI sectors. In each of the PSI domain sub-sections, the corresponding POPSIS case studies are presented through a set of 'snapshots'. These snapshots are brief one-page descriptions of the case studies that contain three sets of information: their key figures, a profile, and key findings.

Geographic information

The following table provides an overview of the core figures from the PSBs under scope in the geographic information domain.

Table 5: Charging policies and their effects in the geo-information domain

Country	Public sector body	Allowing re-use of raw data? Pricing policy Policy change (if any)	Providing added-value services?	Number of commercial re-users	Distinction between commercial and non-commercial licenses?	Number of FTEs involved in re-use facilitation	Revenue per re-use FTE
AT	BEV	Yes, partial cost-recovery. Policy change: price cuts of up to 97%	No	N/A	Yes, rebates for universities.	35	N/A
DE	BKG	Yes, partial cost-recovery.	No	181	Yes	11.5	6,956 EUR
DE	SenStadt	Yes, partial cost-recovery.	No	N/A	Yes	N/A	N/A
DK	DECA	Yes, limited to re-use facilitation costs. Policy change: introduction of a re-use facilitation cost regime	No	26	No	2	130,000 EUR
ES	IGN-CENIG	Yes, partial cost-recovery. Policy change: free provision of PSI for non-commercial purposes	No	40	Yes, non-commercial for free/marginal, commercial at cost-recovery.	42	50,000 EUR
ES	Spanish Cadastre	Yes, zero cost. Policy change: introduction of a zero cost regime	No	N/A	No	11	0 EUR
FR	French Cadastre	Yes, partial cost-recovery. Policy change: price cuts of up to 97%	No	N/A	No, in old pricing model; Yes, in new pricing model.	23	39,130 EUR
IT	Italian Cadastre	Yes, partial cost-recovery.	Yes, exceptionally on a partial cost-recovery basis	less than 100	Yes, free access for research institutes, public bodies, real estate intermediaries.	100	33,000 EUR
NL	Dutch Cadastre	Yes, partial cost-recovery.	Yes, 2.85 M EUR.	15	Yes	144	119,097 EUR
UK	Ordnance Survey	Yes, using market-based pricing. Policy change: introduction of a 'freemium' model	Yes, through some free products.	500 partners	Yes	155 in sales	135,483 EUR

Cost-recovery is the dominant model in the geo-information domain; only the Spanish Cadastre has moved to a zero cost model. However, only the Dutch Cadastre and Ordnance Survey reported that they are selling added-value-services (based on their own raw data).

The cost-recovery ratios – the amount of revenues obtained from charging for raw data to re-users as a percentage of the total budget of the organization – is insignificant for many PSBs in the geographic information sector. Four PSBs recover less than 1% of their total budget, and only two PSBs recover more than 10% (the largest recovery rate is a 16% recovery rate attained by the Ordnance Survey).

The average revenue per re-user, i.e. the charges per re-user, is relatively low, and does not exceed 5,000 EUR per year. Interestingly, the average revenue per re-use FTE seems to increase for those PSBs that have adopted a true re-use facilitation costs model. This appears to be caused mainly by the low number of FTEs required, meaning that there are efficiency gains. It is possible that the lower charges do not lead to proportionally higher costs. In the geo-information sector, the number of re-users may also increase. Hence, there are two sets of benefits: the approach leads to both increased returns and lower costs.

The number of actual commercial re-users¹⁷ is limited in those cases where the PSB is also active in the downstream market (e.g. the Dutch Cadastre). This seems to be caused in the main by the restricted re-use conditions, in particular in cases where intellectual property rights are withheld (these cases include the Dutch and Italian Cadastres). In Italy there are many ongoing conflicts and court cases over alleged added-value services provided by the PSB. In the case of the Italian Cadastre, prices have risen in conjunction with value-added services provided by the PSB, and re-users claim a 30% drop in revenues due to this.

On the other hand, all the PSBs surveyed in the geo-information sector that have undertaken a policy change to facilitate PSI re-use have experienced increasing demand and re-use of their PSI. For instance, in the case of DECA the number of re-users went up by 10,000% leading to a re-use market growth of 1,000% over eight years. The development of new re-use activities following price cuts generally leads to economic growth and more employment, which ultimately results in higher tax revenues. In the case of DECA, it is estimated that the tax gains exceed PSB investment by 400%.

The cases of BEV and the French Cadastre show that substantial (up to 97% in both cases) price reductions are also possible without any additional governmental funding: the increased demand volumes which can be triggered lowered prices may lead to stable or even increasing sales revenues. Indeed, BEV's lowered charges triggered demand increases of up to 7,000% for certain product groups. In total, BEV was able to increase its geo-PSI sales revenues by 46% in the four-year period after the pricing review.

Snapshots of the six case studies undertaken in the geographic information domain are presented. These snapshots permit a quick understanding of the main findings of each case study. The full case study reports are presented in the annex to this report. The table below provides a legend for the case study snapshots.

¹⁷ Those re-users for whom the PSI re-used constitutes one of the main elements of a new product.

Table 6: Legend for the data in the case study snapshots

Indicator	Year of measurement
Yearly budget of the PSB in EUR	This is the total budget of the entire legal entity of the PSB as demonstrated in the annual accounts.
# of FTEs entire PSB	The number of all Full Time Equivalents (FTEs) employed by the PSB.
Assessment # FTEs inside PSB working on facilitation of re-use	The number of Full Time Equivalents (FTEs) that are dedicated to the facilitation of third-party re-use of its PSI (raw data), based on assessments from the PSB.
Assessment revenues PSB from (private sector) re-use in EUR¹⁸	The revenues in Euro received by the PSB from third-party re-use facilitation of its PSI (raw data) are based on assessments from the PSB and re-users. This figure aims to capture 'real re-use'. This expression refers to those re-users that obtain the PSI as an essential source for creating their added-value on top of the PSI. It refers to large commercial re-users who buy large datasets. Hence, it does not include compulsory re-use (e.g. a civil notary requesting an extract from the cadastre to write a deed) or insignificant re-use (a lawyer obtaining a single extract from a chamber of commerce while doing due diligence).
Assessment cost-recovery ratio from private sector re-use	= [(Revenues PSB from private sector re-use in EUR) / (Yearly budget of the PSB in EUR)] * 100%.
Average revenue PSB per FTE working on facilitation of re-use	= (Revenues PSB from private sector re-use in EUR) / (# FTEs inside PSB working on facilitation of re-use).

Each snapshot contains the key figures, key findings and a profile of the PSB under scope.

¹⁸ Where possible the cost recovery ratio is calculated based on private sector re-use revenues only. However, in many cases PSBs do not distinguish between private and public sector PSI sales revenues. In these cases the cost-recovery ratio is calculated based on the total PSI sales revenues.

Bundesamt für Eich- und Vermessungswesen (BEV)



Geographic PSI – POPSIS Objective A



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	85 M EUR
Number of FTEs entire PSB	1,275
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	N/A
Assessment cost-recovery ratio from private sector re-use	N/A
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- The Austrian Federal Office of Metrology and Surveying (*Bundesamt für Eich- und Vermessungswesen* – BEV) is in charge of surveying and mapping and the Austrian Cadastre.
- BEV is a subordinated public sector body of the Austrian Federal Ministry for Economy, Family and Youth (*Bundesministerium für Wirtschaft, Familie und Jugend*).
- BEV is the main provider of geographic PSI in Austria.

Key findings

- In 2006, the Austrian Federal Office of Metrology and Surveying adopted a simplified and more market-oriented PSI pricing approach with drastic price cuts of up to 97% within strict budget constraints (there was no additional governmental funding). The new model was reviewed and amended in 2008 and 2010.
- Prices are now calculated based on regular benchmarking exercises that take into account the PSI market value, prices applied by foreign PSBs for comparable datasets, re-use business conditions, budgetary constraints from the federal government, and the costs of data production and re-use facilitation.
- The reduced prices for PSI and the introduction of a PSI web portal have led to a substantial increase in the number of datasets sold. During 2007, the sales for many BEV PSI products rose significantly: a 200%–1,500% increase for cartographic products, 7,000% for digital orthophotos, 250% for the digital cadastral maps, 250% for the digital elevation model, 1,000% for the digital landscape model, and a 100% increase in external-use licenses. The bulk of this additional demand came from Austrian SMEs. Many new re-use business activities, mainly involving SMEs, have evolved since the implementation of the new model.
- As a result, the total revenues from BEV's geo-PSI sales could be increased by 46% from 2004 to 2009. Without additional governmental funding, BEV could improve the situation for re-use business and secure a wider use of its public data.
- In 2011, five years after the introduction of the new pricing model, the number of purchase orders has stabilized after a period of strong growth following the implementation of the new model. The number of registered customers on the PSI web portal and the number of external licenses are, however, still increasing. Re-use businesses are now also evolving outside of the typical geo-information market, for example in fields such as geo-marketing or location-based services. There is also an increasing demand from international customers.

Bundesamt für Kartographie und Geodäsie (BKG)



Geographic PSI – POPSIS Objective B



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	33.8 M EUR
Number of FTEs entire PSB	254
Assessment # FTEs inside PSB working on facilitation of re-use	11.5
Assessment revenues PSB from private sector re-use in EUR	0.08 M EUR
Assessment cost-recovery ratio from private sector re-use	0.24 %
Average revenue PSB per FTE working on facilitation of re-use	6,957 EUR

Profile

- In Germany, most official surveying and mapping responsibilities are allocated to the 16 *Länder* – not to the federal level. At federal level, the Federal Agency for Cartography and Geodesy (*Bundesamt für Kartographie und Geodäsie* – BKG), placed under the authority of the Federal Ministry of the Interior (*Bundesministerium des Innern*), is the main geo-information PSB.
- In cooperation with the *Länder*, BKG fulfils a coordinating role in terms of data harmonization among the PSBs in charge of geo-information at the *Länder* level. It ensures the provision of aggregated geographic PSI to public administrations at the federal level.
- BKG's data service *GeoDatenZentrum* (GDZ) is one of the three national distribution centres (*zentrale Vertriebsstellen*) for geo-information in Germany. On behalf of the *Länder*, who produce and own the data, BKG distributes geo-topographic data and digital ortho-photos to re-users that want to acquire data from at least two *Länder*.

Key findings

- BKG illustrates the case that revenues from PSI sales may be negligibly small (80,000 EUR in 2010) when compared to the total budget of the PSB (33.8 M EUR in 2010).
- When BKG has proposed to provide at least some datasets free of charge, this has not been accepted. The reasons included budgetary constraints at federal level, established budgetary principles such as benefit taxation (*Äquivalenzprinzip*) that would need to be reviewed, and possible conflicts with the *Länder* which provide BKG with PSI but also sell the data themselves. BKG underlined that it is a purely political decision whether BKG is allowed to provide its data free of charge. BKG cannot take such a decision itself.
- In 2008, the German federal government declared that it considers that all fees for the provision of geo-information should be determined by the re-use facilitation costs (*Bereitstellungskosten*) only.¹⁹ Yet, as the federal level is not the principal holder of geographic PSI in Germany, its influence on pricing is rather limited. The *Länder*, which produce and own the bulk of German geo-information (including most of the PSI provided by BKG), are independent in their pricing decisions and currently do not seem to be willing to give up this competence.
- Most public and private actors agree that the strong federalism in the German public geo-information production – causing the fragmentation of data stocks and pricing policies – is the core problem which needs to be tackled in order to fully reap the benefits of a growing geographic PSI re-use sector. For instance, GEOkomm, a re-user interest group, calls the federalism a 'fiasco for business' and argues in favour of centralization at federal level.

¹⁹ Bundesregierung (2008): „Zweiter Bericht der Bundesregierung über die Fortschritte zur Entwicklung der verschiedenen Felder des Geoinformationswesens im nationalen, europäischen und internationalen Kontext“, *Deutscher Bundestag Drucksache 16/10080*, p. 6.

Senatsverwaltung für Stadtentwicklung Berlin (SenStadt)



Geographic PSI – POPSIS Objective B



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	9.1 M EUR
Number of FTEs entire PSB	120
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	0.945 M EUR
Assessment cost-recovery ratio from private sector re-use	10.38 %
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- The department for geo-information of the *Senatsverwaltung für Stadtentwicklung Berlin* (SenStadt) is the PSB in charge of mapping and surveying in the *Land* Berlin. It is fully integrated in the administration of the *Land*.
- SenStadt operates a partial cost-recovery pricing model for its geo-information in order to meet revenue targets set down in the Budget Law of the *Land* Berlin, and to transpose the AdV pricing guidelines to the regulations of *Land* Berlin.
- The pricing model enables SenStadt to recover approximately 10% of its total costs. The model applies to private re-users and to re-users of authorities which do not belong to the *Land* Berlin. Public authorities of the *Land* Berlin receive PSI free of charge for use within the public task.

Key findings

- The case of SenStadt provides an example of the political and budgetary context that determines the pricing policy of many geographic-PSI-holding public sector bodies in Germany. Many PSBs act under pressure from finance ministries, parliaments and politicians who see geographic PSI as a public asset that needs to be exploited in order to improve the financial situation of their commune or *Land* or to reduce the taxpayers' burden.
- Most PSBs in Germany – including SenStadt – are not free to decide on their PSI pricing policy and target sales revenues. These decisions are mostly taken by finance ministries and the parliaments which vote on the budgets. Yet, according to GEOkomm, a re-user interest group, the German geo-information business faces difficulties in obtaining political support when it fights for lower PSI prices.
- The AdV pricing guidelines applied by SenStadt provide an interesting scheme where the prices of the PSI are determined according to the re-user's turn-over (*Umsatzerlösbeteiligung*). This scheme helps SMEs and innovative start-ups to enter the market by reducing their business risks significantly in comparison to fixed price systems. Indeed, where no turnover is generated, no fees have to be paid. On the other hand, a successful product also benefits the PSI-holding PSB. When companies do not want to reveal their business model to public authorities, they can choose to pay a flat fee.

Danish Enterprise and Construction Authority (DECA)



Geographic PSI – POPSIS Objective A



Key figures

<i>Indicator</i>	2010
Yearly budget of the PSB in EUR	31.6 M EUR
Number of FTEs entire PSB	257
Assessment # FTEs inside PSB working on facilitation of re-use	0.5
Assessment revenues PSB from private sector re-use in EUR	0.26 M EUR
Assessment cost-recovery ratio from private sector re-use	0.6%
Average revenue PSB per FTE working on facilitation of re-use	0.52 M EUR

Profile

- The Danish Enterprise and Construction Authority (*Erhvervs- og Byggestyrelsen* or *DECA*) is a department of the Danish Ministry of Economic and Business Affairs. It is responsible for Danish enterprise and construction policy.
- In 2002 the political decision was taken to establish a central database of all Danish addresses. This policy change was driven by public task ambitions and by distinguishing between the public sector investment and subsequent exploitation of the facility created, allocating the costs to those that benefit, thus freeing the PSB to rely on cost recovery above the re-use facilitation cost level.
- An open network of distributors was established, that can acquire the address data against re-use facilitation costs and without any re-use limitations.

Key findings

- A centrally-run system of address data is not only of vital importance for the proper execution of the public task (such as emergency services, taxation departments and the monitoring and control of safety regulations), it also represents an unprecedented source for the private sector to develop and distribute digital products and services where location is a key element.
- By including the future potential returns (in the form of increased economic activities by the private sector) in the equation when setting up and financing the database, the maximization of re-use potential (by the private sector) became a purpose in itself, preventing the PSB to become reliant on own re-use incomes and allowing to maximize the multiplier effects downstream.
- The policy change ultimately significantly contributed to:
 - A value creation downstream of approximately 57 M EUR;
 - An increase in FTEs employed by re-users by 800 – 1,000 %;
 - An increase in turnover of re-users of around 1,000%;
 - PSB savings of around 5 M EUR, against an investment of around 3 M EUR;
 - An increase in corporate tax gains of around 14 M EUR;
 - A return of PSB investment of around 470%.
- The case illustrates that increased tax returns on the boosted turnover of first- and second-tier re-users downstream in the value chain largely exceed the investments made by the public sector: the establishment of a central database of addresses supported by a re-use policy which only charges minimal re-use facilitation costs and consequently boosts economic activities further down the value chain, has financed the more effective performance of the public task. The PSB has managed to create a self-propelling multiplier that is available to re-users.

IGN-CNIG (IGN-CNIG)



Geographic PSI – POPSIS Objective A



Key figures

Indicator	2009
Yearly budget of the PSB in EUR	52 M EUR
Number of FTEs entire PSB	761
Assessment # FTEs inside PSB working on facilitation of re-use	42
Assessment revenues PSB from private sector re-use in EUR	2.1 M EUR
Assessment cost-recovery ratio from private sector re-use	4 %
Average revenue PSB per FTE working on facilitation of re-use	50,000 EUR

Profile

- The *Instituto Geográfico Nacional* belongs to the Ministry of Public Works and Transportation. Its main activities are cartography, geodesy, photogrammetry, remote sensing, geographic information systems and the national Seismic Network, Geophysics and Astronomy.
- The *Centro Nacional de Información Geográfica* (CNIG) is an autonomous body linked to the IGN. Its goal is to produce, develop and distribute geographic works and publications, including dissemination and commercialization of the products and services from the IGN.

Key findings

- CNIG-IGN has advanced well over the last decade in providing increased access to geographical information for free to re-users for non-commercial purposes (or marginal cost if copying is provided) while implementing a pro re-user commercial policy.
- The effect is a remarkable increase in the number and type of re-users. For instance, re-users buying the PSI have increased from about 10 large companies purchasing the PSI for both commercial and non-commercial purchases (i.e. prior to 2008 when all the PSI was for sale) to a situation today in which over 40 re-users purchase the information for commercial purposes (the majority of them are SMEs) and hundreds of thousands of re-users do so for non-commercial purposes.
- Between 2008 and February 2010, there have been about 165,257 non-commercial requests from 37,417 users (only 2% of these are marginal costs request). Commercialization used to be based on high prices. Only a few major players could afford the initial investment and became re-users. Now prices are based on individual negotiations with the re-users.
- In terms of its revenues, the CNIG-IGN has experienced a steady decrease in product sales since 2004, given that an increasing number of users can access them for free online instead of purchasing them. However, this is compensated by the fact that, over the same period, the centre has experienced a similar increase in services sales. There is now a much larger number of commercial re-users than before and revenues that come from marginal costs applied to re-users. There have been 3,325 requests to pay marginal costs since March 2008, compared to 168,582 total requests (so only about 2% of all requests have a non-commercial purpose).
- Since the download centre service is in place, the centre has also experienced a very high demand from non-commercial users and re-users. For instance, between 2008 and February 2010, there were about 165,257 requests from 37,417 users. There is an increase in terms of visits and usage: since only October 2010, the volume of data services and users has doubled.

Oficina del catastro (Spanish Cadastre)



Geographic PSI – POPSIS Objective A



Key figures

Indicator	2011
Yearly budget of the PSB in EUR	109 M EUR
Number of FTEs entire PSB	2,874
Assessment # FTEs inside PSB working on facilitation of re-use	11
Assessment revenues PSB from private sector re-use in EUR	0 EUR
Assessment cost-recovery ratio from private sector re-use	0 %
Average revenue PSB per FTE working on facilitation of re-use	0 EUR

Profile

- The office of the Spanish Cadastre comes under the umbrella of the Spanish Tax Office. It receives 100% of its funding through the general state budget to meet its public task of collecting and publishing the cadastral information of the Spanish territory (the only exceptions are for the Navarra and Basque Country regions).
- One key feature distinguishes the Spanish Cadastre from many other European cadastres: it also collects information for tax purposes. It has evolved from being a government tax collection and a real estate security service to being a socially valuable tool since these data are used in an increasing number of application and new services.
- In 2010, the cadastre has implemented a zero cost policy. Prior to the policy change, however, the Spanish cadastre was selling the PSI at a high fee and using an outdated model which required several transactions. As a result, very few companies used the model and relatively few revenues came from it (about 343,000 EUR in 2008).

Key findings

- The Spanish Cadastre is a pioneer organization in its facilitation of access and re-use of its PSI for free for both commercial and non-commercial purposes. It has evolved from being a government tax collection and a real estate security service to being a socially valuable tool since this data is used in an increasing number of application and new services. This approach has led progressively to a huge success in demand for the data, with millions of visits and requests to download the cadastre's PSI.
- Since April 2011, re-users benefit from a for free licensing-based mass download service. During its first two weeks of operation, it already experienced high levels of demand and data volumes. The weekly volume of alphanumeric data downloads has increased in only one week by 1,900%, from 67 to 1,203, and the total number of downloads of digital maps by 800%, from 275 to 2,101. The total downloads have increased by nearly 1,000% from 342 to over 3,300.
- Geographic information, and especially cadastral information, is being used to develop many new products associated with a large variety of activities. The cadastral information is increasingly in demand by businesses and citizens for many uses. They include, among others, fleet management, market analysis, site location, geo-postal services, and infrastructure design and management.
- Before the re-users' license service started, the cadastre already had some very remarkable positive effects from the high demand of users accessing and consulting its electronic office. Over 4.5 M digital certifications were provided online per year (compared to about 180,000 offline), with over 20.8 M visits to the electronic online office and over 64.7 M consultations.

DGFIP (French Cadastre)



Geographic PSI – POPSIS Objective A



Key figures

<i>Indicator</i>	2010
Yearly budget of the PSB in EUR	162.5 M EUR
Number of FTEs entire PSB	3,250
Assessment # FTEs inside PSB working on facilitation of re-use	23
Assessment revenues PSB from private sector re-use in EUR	0.9 M EUR
Assessment cost-recovery ratio from private sector re-use	0.6 %
Average revenue PSB per FTE working on facilitation of re-use	39,130 EUR

Profile

- The French Cadastre is managed by the Directorate General of Public Finance (*Direction Générale des Finances Publiques – DGFIP*) at the Ministry of the Budget, Public Accounts and Reform (*Ministère du Budget, des Comptes Publics, de la Fonction Publique et de la réforme de l'Etat*).
- Since October 2008, the digitized cadastral map can be viewed without charge on the www.cadastre.gouv.fr website. For the re-use of cadastral maps, a partial cost-recovery model with a single price of 9.50 EUR per A0 map has been implemented.
- In collaboration with the Agency for the Intangible Assets of the State (*Agence du patrimoine immatériel de l'État – APIE*), DGFIP has recently developed a new charging model for the cadastral map with lower and degressive prices. The central aim is to attract new geo-business re-users. The new model was to be codified and implemented in French law by May 2011.

Key findings

- The case demonstrates that the high fees of the old pricing and licensing model have prevented commercial re-use businesses to evolve. Particularly, no value-added services based on DGFIP's cadastral PSI have been developed. The prices were based on the reproduction costs of paper and plastic maps and did not reflect the reduced costs of transmitting digital data. The prices were not market-oriented; they do not take into account the market value of the cadastral information and the willingness to pay of commercial re-users. For these reasons, no re-user has ever bought the entire cadastral map.
- Some of the large players in the geo-information business were very keen to obtain the cadastral map, but the price of 5.7 M EUR for the entire database inhibited them from developing a sustainable business model. The availability of a comparable product – the *BD Parcellaire* from IGN – at a price of approximately 300,000 EUR did not help the DGFIP to sell its PSI. This situation has led not only to lost opportunities vis-à-vis commercial re-use businesses but also represents lost PSI sales revenues for DGFIP.
- Recognizing the sub-optimality of this situation, DGFIP decided to review its pricing model substantially. In 2011, the French Cadastre was able to adopt a more market-oriented PSI pricing and licensing model with drastic price cuts of up to 97% while respecting a strict budgetary constraint, i.e. no additional governmental funding. The new prices better reflect the market value of the PSI, the re-use facilitation costs incurred and the competitive position vis-à-vis IGN's *BD Parcellaire*. It can be expected that some of the major geo-information companies will purchase the full cadastral map at the new price of 300,000 EUR.

Italian Cadastre Agency (Italian Cadastre)



Geographic PSI – POPSIS Objective B



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	666 M EUR
Number of FTEs entire PSB	9,330
Assessment # FTEs inside PSB working on facilitation of re-use	100
Assessment revenues PSB from private sector re-use in EUR	3.3 M EUR
Assessment cost-recovery ratio from private sector re-use	0.5%
Average revenue PSB per FTE working on facilitation of re-use	33,000 EUR

Profile

- The Italian Agenzia del Territorio (AGTER) was set up as a result of the reform of the Ministry of Economy and Finance. It began operating on 1 January 2001.
- AGTER is now undergoing profound structural changes as cadastral activities in Italy are decentralized.
- Since 2004, digitalized cadastral data can be viewed, partially without charge, on the <http://www.agenziaterritorio.it> website.

Key findings

- The Italian Cadastre (AGTER) shows the rapid evolution and heated discussions stimulated by PSI re-use in Italy. Decisions over the pricing policy of PSI for re-use and value-added services are made in the Ministry of Economy and Finance, and regulated by strategic triennial agreements with AGTER. These agreements emphasize the need for AGTER to maximize revenues from PSI, and these revenues then go directly to the Ministry. There is no information available about how the pricing is established.
- Between 2005 and 2010, the Cadastre Agency has taken some decisions that have affected the market for the re-use of cadastral data, such as the introduction in 2005 of a re-user tax for each re-sale transaction; the provision of value-added services to end-users (banks) previously offered by re-users, combined with a price increase of 550% for raw data for re-use; the release of bulk raw data (*elenco soggetti*), a dataset previously re-sold with a margin by re-users; an increase of 20% of data costs for re-use; and the non-availability of bulk raw data for re-use on cadastral information.
- As a result of the cadastral pricing policy, re-users claim that the overall re-use market has declined substantially during the last years (a decline of about 40% between 2004 and 2010). It is suggested that this has had a detrimental effect on the possible launch of innovative services (re-users are mainly being innovative vis-à-vis their own internal processes so as to ensure that increases in the cost of PSI cost are not passed on to their customers).
- According to AGTER, this is simply due to an efficiency gain in the agency core business processes rather than a form of unfair competition due to its dominant position progressively acquired over the last seven years. At the same time, AGTER sees its intervention into the market as a stimulus for re-users to move forward and offer additional added-value services that it is not providing. It explains the decline in industry re-use revenues as being due to the fact that most of the services undertaken by re-users simply overcame inefficiencies in the cadastral services. In parallel, the definition of personalized value-added services as a core task of AGTER has been changing over the years.
- This controversial discussion has paved the way for approximately 44 court cases.

Dutch Cadastre (Dutch Cadastre)



Geographic PSI – POPSIS Objective B



Key figures

<i>Indicator</i>	2010
Yearly budget of the PSB in EUR	261 M EUR
Number of FTEs entire PSB	1,941
Assessment # FTEs inside PSB working on facilitation of re-use	144
Assessment revenues PSB from private sector re-use in EUR	17.15 M EUR
Assessment cost-recovery ratio from private sector re-use	6.57%
Average revenue PSB per FTE working on facilitation of re-use	0.119 M EUR

Profile

- Traditionally, the Dutch Cadastre maintains public registers recording who owns what rights to land and buildings in the Netherlands and their characteristics, guaranteeing legal certainty as to who owns what and specifying the precise location of property.
- Since 1994, the cadastre is a 'Non-Departmental Public Body' (ZBO). This regime created a certain distance between the PSB and the central government. Over the last decade, stimulated by the political climate in the 1990s, it has developed an entrepreneurial mindset, steadily expanding its activities and enhancing its position as the core PSB in the field of geographic information in the Netherlands.
- To a large extent, this expansion concerns activities which are regarded as authentic public task activities. However, the subsequent abundant availability of high-quality data – in particular the cadastral data sets – has also allowed the cadastre to develop products which, according to re-users, are in direct competition with those of the private sector.

Key findings

- The PSB's mandate to self-finance, combined with a relatively independent position towards the Ministry, has led to a strong drive to expand its public position.
- Its reliance on its own commercial activities creates a natural tendency to protect these interests, leading up to tensions with re-users.
- Central to these discussions is the large discrepancy among the various interpretations of the definition of the public task of the cadastre. According to the cadastre, its public task is the equivalent of the tasks described in the statutory framework (which also mentions and allows for 'economic' activities). Conversely, re-users, put forward that the public task is not the equivalent of the statutory task and that market activities, in particular those where value is added to the PSI, are, by definition, outside the public task.
- The economic interests related to this issue are not insignificant: the part of the cadastre's income that is generated by non-public sector users (not having any statutory obligation to rely on the cadastral data) amounts to around 20.5 M EUR (2010), which accounts for over 6 % of the PSB's entire budget.
- Recently, the Dutch legislator has adopted new rules on economic activities of PSBs including their own sales of PSI. In this context, discussions are likely to become more prominent and may in fact serve as an interesting source of inspiration for the review of the PSI Directive.

UK Ordnance Survey (Ordnance Survey)



Geographic PSI – POPSIS Objective A



Key figures

<i>Indicator</i>	2010
Yearly budget of the PSB in EUR	128.9 M EUR
Number of FTEs entire PSB	1,292
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	23 M EUR
Assessment cost-recovery ratio from private sector re-use	16.5%
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- Ordnance Survey is a non-ministerial government department and an Executive Agency responsible to the Secretary of State for Communities and Local Government.
- It operates as a Trading Fund under the Government Trading Funds Act 1973 and The Ordnance Survey Trading Fund Order 1999.

Key findings

- Ordnance Survey has developed considerably between 2010 and 2011 to accommodate the UK Transparency Agenda and to provide mapping and address information free through its OS OpenData service. As the OpenData products were launched fairly recently, their impact is relatively unknown but there is some initial evidence from re-users that more people are using the free data.
- Since April 2010, Ordnance Survey has provided three tiers of information and maps across four key product categories: topographic mapping, address locations, route networks and consumer mapping – this three-tier structure is described by Ordnance Survey as a ‘freemium’ model. The lowest tier provides the least-detailed information across all four product categories free. The middle tier provides more detailed information and users pay for access. The upper tier provides premium information at the most detailed level.
- Re-users suggest that the recent provision of free information has increased uptake by a variety of users. This, in turn, has led to an expansion in technical support by re-user organizations to use the free data by end-users. Re-users suggested this has also led to an increase in their own value-added services based on free information or associated mapping products.
- Ordnance Survey allows developers and re-users to access samples of all three tiers of information free to see if they can develop an app or service. Fees for commercial exploitation of subsequent developments, alone or in partnership with Ordnance Survey, are then agreed on the basis of the products used and likely usage levels.
- To encourage innovation of Ordnance Survey products and services, it established an Open Innovation programme called GeoVation. This provides seed funding and other support for sustainable business ventures based on geographical information.
- Ordnance Survey has approximately 200 developer partners and 1,250 direct commercial customers. In March 2011 there were 1,386 active web sites using the Ordnance Survey OpenSpace application programming interface (API).

Meteorological sector

The following table provides an overview of core figures from the PSBs in the meteorological information domain.

Table 7: Charging policies and their effects in the meteorological domain

Country	Public sector body	Allowing re-use of raw data? Pricing regime Policy change (if any)	Providing added-value services?	Number of commercial re-users	Distinction between commercial and non-commercial licenses?	Number of FTEs involved in re-use facilitation	Revenue per re-use FTE
DE	DWD	Yes, partial cost-recovery. Policy change:	Yes, but limited to certain sectors; 2 M EUR revenue from processed data, 5 M EUR from added-value services.	25	Yes, rebates for universities.	N/A	N/A
NL	KNMI	Yes, limited to re-use facilitation costs. Policy change: introduction of a re-use facilitation cost regime	No	50	Yes, universities get data at zero costs.	1.5	166,666 EUR
NO	Met.no	Yes, for free and anonymous. If re-user wants delivery guarantee: annual fee 5,750 EUR. Policy change: introduction of a zero cost regime	Yes, 3 M EUR (to former state companies in utility).	3,000 (40% outside Norway)	No	2	0 EUR
SI	ARSO	Yes, partial cost-recovery. Policy change: introduction of a re-use facilitation cost regime (forthcoming)	No	20	No	1	360,000 EUR

Met.no adopted a zero cost re-use model in 2007, the KNMI applied a re-use facilitation cost model as of 1999 and today the DWD applies a partial cost-recovery model and provides added-value services, whereas Slov.Met also applies partial cost-recovery but will soon shift to a re-use facilitation costs model.

The cost-recovery ratios for all meteorological PSBs are less than 1%. This even applies to the DWD that recovers 2 M EUR from its raw data sales (in addition to its recovery of 7 M EUR from processed data and added-value products). However, on its total budget of around 215 M EUR, this cost-recovery is fractional.

The percentage of re-use FTEs is also quite different. In the KNMI, the FTEs who work on re-use facilitation comprise only 0.3% of the entire workforce, whereas in the SloV.Met case the percentage is 3-4 times higher. Again, the difference between the cost-recovery ratio and the re-use FTE ratio may point to some inefficiency in the PSB whereby the two ratios do not contribute to the total budget proportionally.

In all case studies where policy changes to facilitate the re-use of PSI were undertaken, increasing demand and re-use of the PSI have been reported. For instance, the free provision of meteorological PSI in Norway and at prices limited to the re-use facilitation costs in the Netherlands has led to the emergence of strong private weather markets in these countries. The additional tax revenues of this economic activity are estimated to surpass the loss of PSI sales revenues. Besides these downstream effects, KNMI and Met.no have reported beneficial effects on their data quality and internal process efficiency. Indeed, through the intensified use, data deficiencies are flagged up and reported back to the PSBs. Furthermore, regular feed-back from re-users as well as contractual obligations from licensing agreements have led to more professionalism in the re-use facilitation activities and a continuous improvement of internal processes.

In the 2009 Oslo Declaration²⁰ on the data policy of EUMETNET members, the national meteorological services agreed to “progressively expand their set of ‘essential’ data and products made available on a free and unrestricted basis [as well as to progressively expand] their catalogue of data and products licensed for re-use by the private sector, under the PSI directive where applicable.” Moreover, national meteorological services declare their ambition to “adapt their licensing conditions with the objective of delivering more information per price unit.” While all the meteorological offices represented in the POPSIS study had followed through on this commitment to varying degrees, other European national meteorological services have not yet undertaken such steps. Some authors²¹ take the view that high charging for meteorological information in many European countries is a lost opportunity for the economic development of the private meteorological sector in Europe. The 2009 MICUS study²² outlines that “many re-users express their wish for an efficient system providing free meteorological data and unrestrictive licenses, as provided by the public authorities in the United States of America.” The effects of the free provision of meteorological data in the United States of America (USA) is presented in the text box below.

²⁰ EUMETNET Oslo Declaration, 26-27 March 2009.

²¹ Cf. for example Pettifer (2008): *PSI in European Meteorology – an unfulfilled potential*.

²² MICUS (2009): *Assessment of the Re-use of Public Sector Information (PSI) in the Geographical Information, Meteorological Information and Legal Information Sectors*.

Zero cost provision of meteorological PSI in the USA stimulates economic activity²³

“One prime example that demonstrates how U.S. federal information is promoting economic activity is information and data made available by the National Oceanic and Atmospheric Administration. The broad availability of data disseminated by NOAA, particularly weather information, stimulates economic activity and leads to the creation of value-added industries. Rodney Weiher, former Chief Economist at NOAA, noted that the agency adheres to the Circular A-130 guidelines, “set[ting] user fees at a level sufficient to recover the cost of dissemination but no higher, and, in particular, it does not charge prices to recover the capital costs.” In 2008, Weiher wrote that NOAA real-time weather data supplied the private weather service industry with sales of over \$700 million annually.”

Snapshots of the four case studies undertaken in the meteorological information domain are presented. These snapshots permit a quick understanding of the main findings of each case study. The full case study reports are presented in the annex to this report.

²³ Cf. Vollmer (2011): *State of Play: Public Sector Information in the United States*, European Public Sector Information Platform Topic Report No. 25.

Deutscher Wetterdienst (DWD)



Meteorological PSI – POPSIS Objective B



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	214.9 M EUR
Number of FTEs entire PSB	2,427
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	2 M EUR
Assessment cost-recovery ratio from private sector re-use	0.93 %
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- Germany's National Meteorological Service, the *Deutscher Wetterdienst* (DWD), is a public sector body with partial legal capacity under the authority of the Federal Ministry of Transport, Building and Urban Development (BMVBS).
- DWD currently provides most of its PSI based on a pricing and licensing model that aims at partial cost-recovery. Yet, a significant and growing subset of DWD's PSI is provided free of charge to re-users on the DWD website and on an FTP server. Since 2003, DWD has significantly reduced its commercial activities. In particular, it has left the provision of customized weather services to the media entirely to the private sector.

Key findings

- This case study demonstrates how the German National Meteorological Service (DWD) has gradually shifted from a profit-oriented commercial strategy in the 1990s and early 2000s to a PSI strategy that re-focuses the PSB's operations on its core tasks, prohibits the operation in certain commercial areas such as the media sector, and provides an increasing amount of meteorological data free of charge to all types of re-users.
- The ongoing policy transition process has so far yielded a strong increase in PSI re-use. For instance, the number of users of the open FTP server tripled from 2,000 in 2008 to 6,000 in early 2011. From 2002 to 2007, DWD registered an increase in PSI sales revenues of nearly 50% for synoptic data, of nearly 75% for radar data and of nearly 25 % for numerical model data.
- At the same time, it has also attracted fierce opposition from some private meteorological service firms such as the Association of German Private Meteorological Service Providers (VDW), an interest group that concentrates its lobbying efforts on limiting the free provision of PSI by DWD. Indeed, VDW fears that free PSI (beyond primary and processed data) would undermine its members' business models.²⁴
- It appears that commercial re-users that offer high value-added solutions do not oppose the free provision of PSI. Consequently, it can be argued that, once most commercial re-users adapt their business models to DWD's more open PSI policy by innovating and offering more value-added products and services, the opposition to free PSI may fall silent. For their part, commercial re-users will expect all PSI to be available free of charge or priced to recover the re-use facilitation costs only.

²⁴ VDW position papers are available on <http://www.wetterverband.de/>. See for example VDW (2010): *Der Wettbewerb auf dem Wettermarkt* or VDW (2009): *Der DWD im Wettbewerb mit privaten Wetterdienstleistern*.

Royal Dutch Meteorological Institute (KNMI)



Meteorological PSI – POPSIS Objective A



Key figures

<i>Indicator</i>	2010
Yearly budget of the PSB in EUR	56 M EUR
Number of FTEs entire PSB	430
Assessment # FTEs inside PSB working on facilitation of re-use	1,5
Assessment revenues PSB from private sector re-use in EUR	0.25 M EUR
Assessment cost-recovery ratio from private sector re-use	0.45%
Average revenue PSB per FTE working on facilitation of re-use	16,666 EUR

Profile

- The KNMI (the Royal Netherlands Meteorological Institute, *het Koninklijk Meteorologisch Instituut*) was founded in 1854. From the outset, it has been the sole national PSB collecting and providing meteorological information in the Netherlands.
- In the early 1990s, under political pressure it was charged with establishing a commercial arm whose purpose was to recover part of the KNMI's costs from the market.
- Due to conflicts with re-users, in 1999, a firm political decision was taken which forced the KNMI to abandon all market activities to private sector players, to stimulate PSI re-use by the private sector and to sell off its commercial branch.
- By 2009 this policy change had been fully implemented and license costs were not charged anymore, leading to an 80% decrease in price for the full KNMI dataset.

Key findings

- The 1999 switch from full cost-recovery pricing to recovery of the re-use facilitation costs only and the abandonment of its own commercial activities likely contributed to:
 - An increase of the turnover of the private sector re-users by 400%;
 - A boost in re-user employment by 300%;
 - An increase of over 35 M EUR on corporate tax returns;
 - An increase of the level of professionalism within the KNMI and an improved data quality and service delivery;
 - The rise of new business models, offering free services to the public paid through advertising and innovative applications.
- In summary, the KNMI case features an example of a PSB that has taken the decision to (1) fully focus on its public task only and step out of any commercial activity, and (2) to adopt a pricing system whereby the costs for the facilitation of re-use are fully recovered by charging the re-users. As this decision was taken more than ten years ago, the subsequent economic effects, both upstream and downstream, are now distinctive and solid, providing clear evidence on potential effects of a liberal re-use regime.

Norwegian Meteorological Institute (Met.no)



Meteorological PSI – POPSIS Objective A



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	58 M EUR
Number of FTEs entire PSB	425
Assessment # FTEs inside PSB working on facilitation of re-use	2
Assessment revenues PSB from private sector re-use in EUR	0
Assessment cost-recovery ratio from private sector re-use	0
Average revenue PSB per FTE working on facilitation of re-use	0

Profile

- Met.no is the national meteorological institute of Norway. Since 2007 it not only works on a zero cost basis (not distinguishing between access and re-use) for its own data. It also offers access to and re-use of a subset of meteorological data from other national meteorological offices for free (without imposing restrictions on the re-use of those data) through a well regarded portal: yr.no.
- This PSI policy is based on the institute's philosophy that withholding data for sale and to generate a minor addition to its own budget would not outweigh the huge societal benefits of opening up the data completely, for free for use and re-use.

Key findings

- This policy change was sparked by belief, commitment and thought leadership on the part of the PSB itself bottom-up rather than top-down. Based on sound socio-economic analysis, the business case was explainable, in particular at political level: it succeeded in bringing about an irreversible thrust to open up the data for both citizens and re-users.
- The case demonstrates the huge re-use potential. Indeed, since the policy change the following downstream developments have been observed:
 - The number of re-users grew by 3,000%: It shifted from around 100 to 3,000 unique re-users per week.
 - Increasingly, re-users come from outside of Norway. These foreign re-users appear to be SMEs integrating data with other content (in the media sector) and apps developers.
 - The increased tax returns (at least 100% increases) easily exceed the loss of income and the slight increase in uncovered re-use facilitation costs.
- Also, by actively disseminating all its information to the general public, the PSB has created a direct link with end-users. This not only has a powerful quality assurance function, but has also consolidated the policy's business case (and its public funding) and has protected it against currents that may want the reverse the financing model.
- In summary, the case demonstrates the huge potential effects of a change in PSI re-use policy as well as a PSB's strategy to initiate, harness and consolidate such a step, establishing a strong 'public sector business case', creating a line of defence against potential counter-movements in times of budget constraints of the central government.

Slovenian Met Office (ARSO)



Meteorological PSI – POPSIS Objective A



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	6 Million EUR
Number of FTEs entire PSB	89
Assessment # FTEs inside PSB working on facilitation of re-use	1
Assessment revenues PSB from private sector re-use in EUR	0,36 M EUR
Assessment cost-recovery ratio from private sector re-use	6%
Average revenue PSB per FTE working on facilitation of re-use	36.000 EUR

Profile

- The Environment Agency of the Republic of Slovenia (ARSO) is a body of the Ministry of the Environment and Spatial Planning.
- The Meteorological Office (ARSO/Met.Office) is one of the six offices within the agency. The Meteorological Office performs the task of providing a national meteorological service. Additionally, it carries out analytical, research and other expert tasks. It provides meteorological observation and numerical data, and value-added forecast products such as meteorological forecasts.
- In 2009, the Slovenian Meteorological Office has introduced free electronic data at the beginning of 2009. Further, the PSB is in the process of moving from full cost-recovery pricing to a partial cost-recovery model (they total 20% of the total costs, with only up to 5% of that sum chargeable to a single re-user). This will result in a 95% decrease in the price of the data for which the PSB is awaiting the final approval from the Slovenian Government.

Key findings

- Since the introduction of free electronic data, the office did not experience any loss in revenues or incur any high costs (only the cost of the extension of the online portal). Nevertheless, the efficiency gains, due to free online access of XML data for small re-users, were significant. They have led to a decreased workload related to a reduction in numerous small written and email request from re-users.
- Further, the revenues from PSI sales and added-value services have not changed. Even the number of re-users has not altered, as the small number of re-users who previously paid for access to basic data have been replaced by new customers buying value-added services. These are largely new media companies.
- The release of free data has brought important benefits to end-users and small re-users. Several SMEs make use of the online data and offer very low value-added services (such as mobile apps and media forecasts). Some innovative services, such as mobile hail alerts and mobile weather applications, are now being offered by commercial companies and individual developers.
- It is currently difficult to foresee if forthcoming pricing change (to be approved by government) will have an impact on the market. For now, re-use in Slovenia is not widely recognized as a business opportunity. The meteorological PSI re-use sector in Slovenia is not mature at the present time, and is based on low value-added services.
- The case shows that, in smaller and as yet immature markets, the changes in pricing policy mostly benefit end-users and small re-users that produce low added-value services. The changes provide efficiency gains to the PSB without having an impact on its revenues.

Business registers

The following table provides an overview of core figures from the PSBs in the business register domain.

Table 8: Charging policies and their effects in the business register domain

Country	Public sector body	Allowing re-use of raw data? Pricing policy	Providing added-value services?	Number of commercial re-users	Distinction between commercial and non-commercial licenses?	Number of FTEs involved in re-use facilitation	Revenue per re-use FTE
IT	Infocamere	Yes, partial cost-recovery	Yes, processed data and services.	43	No	N/A	N/A
NL	KvK	Yes, partial cost-recovery	No	N/A	No	N/A	N/A
UK	Companies House	Yes, limited to re-use facilitation costs	No	N/A	No	N/A	N/A

Obtaining reliable figures on FTEs involved in the facilitation of re-use in the PSI domain turned out to be quite burdensome. Apparently, the PSBs do not make a distinction between data input (registration of businesses) and the output (provision of data). This also applies to the measurement of those revenues generated through the public task (e.g. provision of data to a lawyer checking the representation rights of a person in a company) and the revenues yielded through the sale of large amounts of data, either through the PSBs' own added-value products or selling raw data to re-users.

All the business registers surveyed operate cost-recovery regimes with relatively high PSI sales revenues and cost-recovery ratios. This goes against the patterns observed in other PSI sectors and can be explained by the specific financing structure of business registers. Typically, business registers do not receive any governmental funding. Rather, they rely on two income streams that correspond to their main activities: (1) fees for registration of businesses and (2) charges for the provision of business information. The two activities generally do not cross-subsidize each other.

In their report on models of PSI provision by UK trading funds²⁵, Pollock et al. suggest that “a change from an average cost to a marginal cost regime [by the UK Companies House] would be welfare improving”. Furthermore, the authors suggest that the resulting drop in PSI sales revenues “could be covered by the registration side of [the PSB’s] operations”.

²⁵ Pollock, R., D. Newbery and L. Bently (2008), Models of Public Sector Information Provision via Trading Funds, BERR (commissioned by HM Treasury and BERR), pp. 67ff and p. 110.

Besides the PSI Directive 2003/98/EC, the pricing policies of business registers in the EU and EEA Member States are also regulated by European company law. Article 3 para 2 of the First Council Directive 68/151/EEC amended by Council Directive 2003/58/EC stipulates that a business register PSI should be provided “at a price not exceeding the administrative cost thereof”. This article is stricter than Article 6 of the PSI Directive which gives PSBs the possibility to recover their costs as well as a reasonable return on investment. Meanwhile, the Capital Taxes Directive (Council Directive 69/335/EEC) and subsequent case law (notably ECJ case C-188/95) mean that registration fees cannot exceed the costs of the registration. Thus, a cross-subsidization of the data provision activities by the registration activities of business registers – as suggested by Pollock et al. – may not be compatible with existent European company law.

There are substantial price differences between different business registers in Europe. While the entire dataset of UK Companies House can be purchased for about 1,340 EUR, each of InfoCamere’s re-users pays on average 720,000 EUR in licensing fees annually. Some business registers may therefore possess the possibility to better exploit the price mechanism, i.e. decrease their prices and still maintain as stable their level of revenue due to increased demand volumes.

Snapshots of the three case studies undertaken in the business register information domain are presented. These snapshots permit a quick understanding of the main findings of each case study. The full case study reports are presented in the annex to this report.

Italian Chambers of Commerce (Infocamere)



Business register PSI – POPSIS Objective B



Key figures

<i>Indicator</i>	2010
Yearly budget of the PSB in EUR	96 M EUR
Number of FTEs entire PSB	8,200
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	30.6 M EUR
Assessment cost-recovery ratio from private sector re-use	31.3%
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- Through its company InfoCamere, the Italian Chambers of Commerce (consisting of more than 500 local, regional and other organizations) are required by Italian law to maintain a business register.
- The register holds details of more than six million companies (1.2 million limited companies, 1.2 million partnerships and 3.7 million individual companies).

Key findings

- A partial cost-recovery pricing model is applied by InfoCamere, and the prices of both raw and processed data are set by the Italian Ministry of Economic Development. No changes in prices or pricing model have occurred in the last few years. InfoCamere receives 31 M EUR per year from 43 re-users, for an average income of 720,000 Euros per user. This represents about-one-third of the revenues of InfoCamere.
- Raw data are available to re-users who are also known as 'distributors'. Having access to raw data as a distributor is not an option for every paying customer. The selection procedure is subject to a number of criteria, such as size and technological capability. The number of re-users has remained stable over time and is heavily concentrated: the top three to four distributors account for nearly 80% of the business intelligence information providers in Italy, a market which is estimated at between 500 to 1,000 M EUR.
- Overall, the size and structure of the market has remained stable in Italy (globally it is expected to grow at 4% CAGR), while InfoCamere revenues from PSI have slightly decreased in the last two years.
- Infocamere sells not only processed data as defined by Italian law but also value-added services, such as data visualization tools or iPhone apps, to end-users. According to the Italian Business Information Industry Association (ANCIC), this practice limits the development of third-party applications and services and represents a case of unfair competition. However, no case has ever been taken in court.
- The high prices of the business register data do not appear excessive to existing re-users, nevertheless, they could pose a significant barrier to entry for new players.

Dutch Chamber of Commerce (KvK)



Business register PSI – POPSIS Objective B



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	240 M EUR
Number of FTEs entire PSB	1,946
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	47.3 M EUR
Assessment cost-recovery ratio from private sector re-use	19.5 %
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- The responsibility of running the business register is largely allocated to the umbrella organization of the Chambers of Commerce – the Dutch Association of Chambers of Commerce (KvK NL).
- The current register holds details on over 2.2 million businesses, associations and foundations throughout the Netherlands. The Ministry of Economic Affairs, Agriculture and Innovation acts as the supervisor of the registry on the government's behalf.

Key findings

- The PSB is fully dependent on revenues from registrations and provision of its data. It does not receive any funding from the state budget.
- The KvK collects approximately 67.4 M EUR (about 56% of its total budget) from its registration activities (*de registraties*), and 53.3 M EUR (about 44% of its total budget) from the provision of information from the register (*de verstrekkingen*), to both governmental and private sector users.
- Based on the current policy principle set by the supervising Ministry, the KvK has to cover as much of its costs as possible from the income from the provision of data while the remaining proportion comes from registrations.
- Under this mandate, the KvK is facing some opposite trends that, nevertheless, operate in parallel:
 - Pressures to maintain the costs of registration at the current level or even lower than that level;
 - Signals that the Ministry is in the process of embracing the spirit of open data, so that it appears to want to stimulate PSI re-use (for free) of KvK data;
 - Recurrent political debates about direct marketers using the KvK data (company addresses in particular) for 'printed' materials, which results in privacy concerns, and questions about the legitimacy of the KvK in selling its data;
 - KvK's own downstream market activities, in particular those provided for free, that trigger disputes with re-users centred on how the public task can be demarcated.
- In summary, the KvK is an example of PSB caught in the 'own re-use income reliance trap'. In addition, the ability of the KvK to make changes to its charging policy is fairly limited: not only is it highly dependent on these incomes, but the Ministry is also very eager not to increase registration charges. Any move towards lowered re-use charges would therefore need to be initiated by the central government, rather than bottom up.

UK Companies House (Companies House)



Business register PSI – POPSIS Objective B



Key figures

<i>Indicator</i>	2010
Yearly budget of the PSB in EUR	74.9 M EUR
Number of FTEs entire PSB	1,063
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	15.5 M EUR
Assessment cost-recovery ratio from private sector re-use	20.7%
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- Companies House became an Executive Agency on 3 October 1988 as part of the government's Next Steps initiative. The agency subsequently took on a range of delegated powers from the former Department of Trade and Industry. It started operating as a Trading Fund on 1 October 1991.
- Companies House operates on the basis of cost recovery.
- The register holds the details of more than two million limited companies registered in Great Britain. More than 300,000 new companies are incorporated each year.

Key findings

- Companies House provides a good example of a Trading Fund organization that has remained remarkably stable over a long period. Prices for products remained static between 2005 and 2010. Small reductions were introduced in April 2010; for example, the price of most bulk products decreased by 10%.
- The sale of data contributed 13.8 M GBP (20.8% of total income) in 2009/10. Bulk data sales (of large parts of the core database that are regularly updated) to companies such as Dun and Bradstreet (D&B) and Experian contributed about 1 M GBP (7.3%) to the dissemination income. 20,000 subscription account holders (mainly SMEs such as lawyers and accountants) contribute about 8 M GBP (58.0%) to dissemination income. The remaining 4.8 M GBP (34.8%) of dissemination is derived from one-off web users who search the website at the cost of 1 GBP per company. The costs directly associated with the sale and dissemination of data were 12.7 M GBP (19.0% of total expenditure).
- Companies House budgetary and pricing procedures are governed by a number of different factors. United Kingdom (UK) Trading Fund regulations state that year-on-year income should be sufficient to meet outgoings that are properly chargeable to the revenue account. Companies House fees are linked, as required by European Law and HM Treasury guidance, to the forecast cost of providing each service and also to the way in which Companies House customers access them. Companies make a payment to register their details when the company is established and annually thereafter to update details. The amended First Company Law Directive requires copies of company records to be made available to the public at a price not exceeding the "administrative cost" of producing them.

Other PSI domains

The following table provides an overview of core figures from the PSBs in other PSI domains which fell under the scope of this study.

Table 9: Charging policies and their effects in other PSI domains

Country	Public sector body	Allowing re-use of raw data? Pricing policy Policy change (if any)	Providing added-value services?	Number of commercial re-users	Distinction between commercial and non-commercial licenses?	Number of FTEs involved in re-use facilitation	Revenue per re-use FTE
ES	CENDOJ	Yes, partial cost-recovery. Policy change:	Not outside its public task (anonymizing data, xml text treatment).	28	Yes, non-commercial for free in certain limits, commercial at cost-recovery	5	300,000 EUR
FR	DILA	Yes, limited to re-use facilitation costs. Policy change: introduction of a re-use facilitation cost regime and free provision of data to citizens.	No	Estimated at 100	Yes	N/A	N/A
FR	SIRCOM	Yes, partial cost-recovery	No	9	Yes	Estimated at 3	59,666 EUR
DE	DeStatis	Yes, zero cost. Policy change: introduction of a zero cost regime	Yes, exceptionally on a full cost-recovery basis.	64% of 3,100 standard/premium accounts	Yes, rebates for universities	N/A	N/A

These PSBs and their PSI are quite diverse in type and, hence, comparisons are less obvious. Examples include the SIRCOM which provides French fuel prices, CENDOJ which covers all Spanish case law, the DILA on French legal content, and Destatis which deals with German statistical data.

Nevertheless, as with the other PSI domains, the cost-recovery rate is relatively low even if, in the cases of the CENDOJ and SIRCOM, it is above 10%. The charges charged by the CENDOJ appear to be relatively high when compared to all other cases, including those in other domains. Equally, the revenue per re-use involving FTEs is significantly higher. The CENDOJ has costs that are related to the anonymization of court sentences and their transfer into XML format that partly explain this observed difference.

Snapshots of the four case studies undertaken in other PSI domains (legal information, fuel prices information and statistical information) are presented. These snapshots permit a quick understanding of the main findings of each case study. The full case study reports are presented in the annex to this report.

CENDOJ (CENDOJ)



Legal PSI – POPSIS Objective B



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	9 M EUR
Number of FTEs entire PSB	32
Assessment # FTEs inside PSB working on facilitation of re-use	5
Assessment revenues PSB from private sector re-use in EUR	1.5 M EUR
Assessment cost-recovery ratio from private sector re-use	17 %
Average revenue PSB per FTE working on facilitation of re-use	300,000 EUR

Profile

- The CENDOJ (the Spanish Judicial Documentation Centre) is the public content holder of all Spain's legal documentation. Since its foundation in 1997, CENDOJ has by law been dealing with the collection, organization and dissemination of the judgements of the Spanish Supreme Court and other collegiate courts. It plays an important role in guaranteeing access to this kind of PSI to all Spain's publishing companies, organizations and citizens.
- The CENDOJ practices a partial cost-recovery pricing model for its PSI which distinguishes non-commercial re-use from commercial exploitation. These costs relate mainly to the high expenses incurred by the PSB to process the sentences and anonymize them to meet its public mandate.

Key findings

- With the arrival of new ICTs, CENDOJ has implemented a system for disseminating judicial statements for free and has operated a pro re-user policy. Today the PSI can be accessed for free for consultation purposes by any citizen who does not intend to re-use the information. Since 2002, the CENDOJ's pricing policy for commercial re-users has been based on a license cost per sentence, which has allowed for an increase in the type and number of re-users. The CENDOJ's online PSI has increased its number of products to about 72 quality databases that can be accessed by re-users.
- As a result, commercial re-users have increased from only two large publishers acquiring the PSI a decade ago to over 28 publishers in 2010, including both large companies and SMEs. This growth has been facilitated, among other reasons, as a result of the change in pricing model from a fixed high total price to a price per sentence-based model. The number of Supreme Court case judgements delivered to publishers for re-use doubled between 2002 to 2009 and reached 1.34 million in 2010.
- However, some commercial re-users have complained that they find the current prices too high. To acquire the whole database costs about 3.4 M EUR per year (4.5 M sentences at 1.5 EUR after applying a 50% discount). Each year the CENDOJ processes about 350,000 sentences, which means making an annual investment of 262,000 EUR to acquire all the new sentences. Some re-users argue that it is difficult for new entrants and SMEs to pay these fees if they are to be able to compete in the legal information market (which is dominated by large multinationals).
- Currently, the CENDOJ expects that re-use will increase even further with the development of a new portal put into place in February 2011. The new website offers, for the first time, a unique one-stop shop point of access to all the tribunal sentences in Spain in all the Spanish languages as well as in English and French.

DILA (DILA)



Legal and administrative PSI – POPSIS Objective A



Key figures

Indicator	2009
Yearly budget of the PSB in EUR	135 M EUR
Number of FTEs entire PSB	1,055
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	0.9 M EUR
Assessment cost-recovery ratio from private sector re-use	0.67 %
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- The Directorate of Legal and Administrative Information in France (*Direction de l'Information Légale et Administrative – DILA*) is a directorate of the Secretary-General of the French Prime Minister (*Secrétariat Général du Gouvernement*).
- DILA's public task involves the distribution of legal information, public publishing and administrative information. DILA will also be in charge of the technical implementation and the financing of the forthcoming French inter-ministerial data.gouv.fr PSI portal.
- DILA is financially independent and does not receive any government funding. It is financed mainly through the sale of announcements. DILA currently offers different licenses for the re-use of its PSI. Prices are limited to re-use facilitation costs (*coûts de mise à disposition*). The viewing and extraction of the data in reasonable quantities (which do not lead to economic activity) are free of charge.
- DILA has implemented a sophisticated PSI web portal – *Légifrance* – that provides access to a large stock of legal information for citizens free of charge and without registration. Commercial re-users can acquire licenses for fees which are limited to the re-use facilitation costs.

Key findings

- The free provision of PSI to citizens via *Légifrance* was and is still heavily resisted by many commercial re-users that claim the loss of several million EUR in revenue per year.
- The introduction of the new public service mission to provide citizens with free legal information via the internet has forced commercial re-users to review their business models and to offer more sophisticated value-added services such as personalized interfaces and alerts, commentary on legal documents, and mash-ups of different legal databases. Commercial re-users admit that they had underestimated the potential of electronic legal information in the early 2000s and had not been prepared to fight their new 'competitor' *Légifrance*. They had not spotted the switch from paper to electronic media. Hence, they were severely hit by the free provision of legal information on the *Légifrance* web portal. As they had underestimated the market impact of *Légifrance*, they had not undertaken massive lobbying to stop or limit the government's initiative. Once *Légifrance* was implemented in 2002, the commercial re-users had no choice other than to review their own business models and to develop services that provide more added-value for their customers.
- DILA has recently developed a new pricing model that, according to its plans, will be codified and implemented by the end of 2011. The new model focuses on partial cost-recovery with a reasonable return on investment (10%). To remove barriers to entry, the new model will propose a 'pay per use' scheme, which is intended to be attractive to SMEs and start-up companies.

SIRCOM / APIE (SIRCOM)



Fuel prices PSI – POPSIS Objective B



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	1.125 M EUR
Number of FTEs entire PSB	21
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	0.179 M EUR
Assessment cost-recovery ratio from private sector re-use	15.91 %
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- Since January 2007, the Communication Service (*SIRCOM*) of the French Ministry for the Economy, Finance and Industry (*Ministère de l'Économie, des Finances et de l'Industrie*) has been collecting data on fuel prices in France. All fuel prices are freely available to citizens on the www.prix-carburants.gouv.fr governmental portal. The public database aims at enabling citizens to make informed choices when buying fuel.
- In early 2009, a pricing and licensing system was introduced by SIRCOM in cooperation with the Agency for Intangible State Assets (*Agence du patrimoine immatériel de l'État – APIE*). The model proposes a license for commercial re-use at 38,500 EUR a year and another license for non-commercial or internal PSI re-use at 5,000 EUR a year.

Key findings

- Since the introduction of the pricing and licensing model for SIRCOM's fuel prices database in 2009, a market with nine first-tier and at least ten second-tier re-users has evolved. PSI is used internally by fuel station networks for pricing optimization and externally by re-users to develop smart phone applications, GPS applications and B2B services.
- At least 24 jobs have been created in French SMEs. Two start-up companies could become European champions. They provide data products and services to large multinationals in the geo-information and mobile communication business. In addition, third-tier re-users are active in the market: they provide the PSI mainly free of charge as a result of business models based on advertising revenues.
- APIE argues that the commercial licenses have had a stabilizing effect on the market. The licenses have clarified the legal rights of the re-users and the obligations of the government. They provide security of data supply over a period of at least three years (this is the length of the licensing agreement) and have forced the government to maintain a high level of data quality (by verifying the prices regularly). The licenses clarify who is not allowed to re-use the data and who is allowed to do so and for what purpose. Therefore, the licenses were recognized by banks as a real asset and a basis for a business model: it was on this basis that the banks were persuaded to finance the expansion of the two SMEs. APIE asserts that, before the introduction of the pricing and licensing model when re-use was free (because it was not regulated), nobody wanted to invest in the re-use of French fuel price PSI. NAVX, the leading commercial re-user, confirms this view.
- On the other hand, 'Open Data' activists have argued that the model is 'discriminatory' and a 'barrier to entry, growth and innovation'. They point to the coincidence of the evolution of a new market for smart phone and GPS apps with the development of the fuel prices PSI pricing and licensing model. In their opinion, the re-use sector and economic growth might have been even larger if fuel price PSI had been provided free of charge.

Statistisches Bundesamt (DeStatis)



Statistical PSI – POPSIS Objective A



Key figures

Indicator	2010
Yearly budget of the PSB in EUR	177.7 M EUR
Number of FTEs entire PSB	2,689
Assessment # FTEs inside PSB working on facilitation of re-use	N/A
Assessment revenues PSB from private sector re-use in EUR	0.2 M EUR
Assessment cost-recovery ratio from private sector re-use	0.1 %
Average revenue PSB per FTE working on facilitation of re-use	N/A

Profile

- The German Federal Statistical Office (*Statistisches Bundesamt*) is an independent public administration within the sphere of the Federal Ministry of the Interior (*Bundesministerium des Innern*).
- Over the last two decades, the Statistical Office's PSI distribution and pricing model has been modified several times, mainly due to contextual changes. Gradually, the PSB has shifted to a model where all PSI can be downloaded free of charge and without registration.
- The free provision of PSI, and the continuous improvements (with regard to technical features and scope) in the PSI database *GENESIS-Online*, have led to a substantial increase in re-use – thereby achieving more effectively the Statistical Office's public task of disseminating its information widely.
- Users have to register only if they want to benefit from additional personalized services, such as permanent storage of table structures for retrieval, retrieval of large volumes of data, or the GENESIS web services. These additional services are available on a chargeable basis only: 50 EUR for a standard account and 500 EUR for a premium account. Educational institutions receive a 50% discount. The fees for the standard and premium accounts (total revenues in 2010: 152,000 EUR) cover the re-use facilitation costs incurred by the Statistical Office for the additional service offering. All users now access the same data; paying registered users do not acquire more or other data.

Key findings

- Destatis' zero cost pricing approach has led to a substantial increase in PSI downloads and has enabled the Statistical Office to better achieve its public task of wide dissemination of its information to society at large. For instance, the free availability of all statistical PSI has led to a considerable increase in data downloads, thereby achieving the Statistical Office's public task of disseminating its information widely. The yearly table downloads increased by about 800% from 130,271 in 2004 to 1,092,938 in 2010. Clearly, the bulk of the additional demand for statistical PSI comes from re-users who download the data for free without purchasing a standard or premium account. On the other hand, the number of customers holding a standard 50 EUR a year account can be kept relatively constant. At the end of 2007, there were 3,390 standard accounts; at the end of 2010, 2,955 customers held a standard account for the GENESIS-Online database. The number of premium customers paying a yearly fee of 500 EUR has increased from 55 at the end of 2007 to 69 at the end of 2010.
- The drivers for change were mainly of a contextual nature. They included the U-turn made in Eurostat's pricing approach and the changing legal framework. Internal factors such as high administrative costs for invoicing and licensing, and the realization that most citizens were not willing to pay for statistical PSI, also played an important role in this transition process.

3.2.3 Economic effects of lowered PSI re-use charges

This sub-section offers an analysis of the specific economic effects of lowered PSI re-use charges. It is sub-divided into five different sub-sections:

- (1) Caveats;
- (2) Overview;
- (3) Downstream effects;
- (4) Effects of lowered charges on PSBs;
- (5) Effects on employment and tax gains.

(1) Caveats

Measuring effects is not always easy

Firstly, all the case studies examined demonstrate that the actual implementation of new PSI policies may take quite some time (e.g. in the KNMI case, the entire operation took about nine years) or emerge in waves (e.g. BEV, Destatis and the Spanish Cadastre). This makes it more difficult to associate very precisely the changes with the effects of change. Other factors may contribute to the effects measured: they include the impact of technology on costs and the autonomous growth of the market.

A second complication is that many PSBs do not consider it their task to monitor the effects, let alone re-use effects, of their policy changes. On the other side, however, they do quite often monitor the increase in website visitors, the amount of data downloaded and sometimes the country of origin of the re-users. Some PSBs have adopted a re-use charging model which is based on re-user characteristics: this allows them to stratify categories of re-users. Unfortunately, in many of the cases where interviews took place, interviewees claim that these data are of a confidential nature.

Thirdly, due to the character of digital PSI, the effects of charging will have network effects: hence, the PSI is dispersed downstream into the next chains of users.²⁶ These network effects are extremely hard to monitor and measure. Apart from the DECA case, none of the PSBs had any insights into the effects of their policy on second-tier users or those users located further down the value chain.

Moreover, determining these kinds of effects beyond the first tier of re-users is difficult, especially with regard to the effects lower down the value chain. This observation particularly applies to PSI which is of an infrastructural character (e.g., the address data in the DECA case) where the effects spread rapidly and on a large scale over millions of re-users. In those domains where the value chain is restricted in size, and where the value of the PSI remains a core element and the number of re-users can more or less be counted, the effects are easier to capture (as is the case, for instance, in the meteorological domain).

²⁶ Cf. Paul F. Uhler (2009): *The Socioeconomic Effects of Public Sector Information on Digital Networks*.

Fourth and finally, the case studies demonstrate that, although charging is an important element, other framework conditions also influence the re-use market. For instance, re-users may be less enthusiastic to invest and innovate (on the basis of the lower charges) if the PSB is still active in the downstream market in selling its own added-value products. In order to avoid unfair competition in the downstream market, the commercial arms of most PSBs have to acquire the PSI raw data under the same conditions as private commercial re-users. Given such equal treatment conditions, the commercial arms of PSBs have to pay the same price for the PSI and respect the same re-use conditions as their private downstream market competitors. However, some private commercial re-users claim that the commercial arms of PSBs still possess a competitive advantage. This advantage may occur for two reasons: as the result of a smaller administrative burden (related mainly to licensing and invoicing) or shorter data provision delays. Indeed, in many cases the commercial arm of the PSB has direct internal access to the data which private re-users have not. Moreover, some re-users fear that inaccurate internal accounting in the PSBs may lead to a cross-subsidization of their commercial arm and thereby to unfair competition with commercial re-users. Some private commercial re-users have therefore argued in favour of a clear organisational separation of the operations that take place under the public task and those related to a PSB's commercial arm. Others advocated that commercial activities by PSBs should be abandoned.

(2) Overview

The table below provides an overview of seven case studies. The micro-economic effects observed in these cases are the result of a PSB shifting from a cost-recovery model towards re-use facilitation charging and marginal/zero cost charging for commercial and/or non-commercial re-use purposes.

Table 10: PSI policy changes and effects

Case study	Policy change	Effects
BEV	<p>2006</p> <ul style="list-style-type: none"> Moved from a complex full cost-recovery pricing regime based on the costs of mainly analogue products (such as paper maps) to a simplified partial cost-recovery pricing and licensing model with drastic price cuts of up to 97%. Regular reviews (2008, 2010). Introduction of a web portal. 	<p>2009 and 2010</p> <ul style="list-style-type: none"> Substantial increase in the number of datasets sold: sales for many BEV PSI products increased significantly: cartographic products by +200% to +1,500%; digital ortho-images by +7,000%; digital cadastral map and elevation model by +250%; the digital landscape model by +1,000%. Total revenues from geo-PSI sales increased by +46%, in spite of large price cuts. The bulk of the additional demand comes from Austrian SMEs.

Destatis	<p>2004 – 2006</p> <ul style="list-style-type: none"> • Dissemination and communication strategy was focused on the internet as the main data distribution channel. • All downloads from the online shop were made available free of charge. • Portfolio of print publications was drastically reduced. • Users have to register only for personalized services available against very limited re-use facilitation costs. • Liberalization of intellectual property rights. 	<p>2010</p> <ul style="list-style-type: none"> • Table downloads increased by +840% (130,271 in 2004 to 1,092,938 in 2010). • Around 25% of the users are private sector users. • Costs of re-use and FTEs working on facilitation of re-use have remained stable. • Re-use facilitation costs are broadly the equivalent of revenues.
DECA	<p>2002</p> <ul style="list-style-type: none"> • Under a 'free of charge' agreement a central database of all Danish addresses was established, motivated by public task ambitions. • Local PSBs were compensated for losses and rewarded by free re-use. • By distinguishing between the public sector investment and subsequent exploitation of the facility created, allocating the costs to those that benefit, there was no need to rely on cost-recovery above the re-use facilitation cost level. • An open network of distributors was established, acquiring PSI against re-use facilitation costs only. • An almost 100% decrease on variable charges and relatively small fixed costs (0.01 M EUR). • No re-use limitations. 	<p>2010 (cumulative)</p> <ul style="list-style-type: none"> • Turnover of re-use market increased by +1,000%. • Number of re-users went up by +10,000%. • FTEs employed by re-users were boosted by +800% to +1,000%. • Tax gains exceed PSB investment by 400%. • A self-propelling and financing re-use system maximizes the multiplier effects in downstream markets.
IGN-CNIG	<p>Pre-2008</p> <ul style="list-style-type: none"> • Prior to 2008, all the PSI was for sale. There were only ten re-users (including both commercial and non-commercial re-users). Hence the increase in re-users has been remarkable. • The Institute has increased access to geographical information for free to re-users for non-commercial purposes (or marginal cost if copying is provided) while implementing a pro re-user commercial policy. 	<p>Post 2008</p> <ul style="list-style-type: none"> • Today over 40 re-users (the majority of them are SMEs) purchase the information for commercial purposes. • Since October 2010, the volume of data services and users has doubled. • Between 2008 and February 2010, there have been about 165,257 requests from 37,417 non-commercial re-users.

KNMI	<p>1999</p> <ul style="list-style-type: none"> • Switch from full cost-recovery charging to recovery of the re-use facilitation costs only. • This has led to an 80% decrease in price for the full KNMI national meteorological dataset. • Abandonment of its own commercial activities. • Sale of the commercial arm. 	<p>2010 (cumulative)</p> <ul style="list-style-type: none"> • Private sector turnover grew by +400%. • Boosted re-user employment by +300%. • Stimulated innovation. • New business models arose. • Extra tax gains amount to total of 35 M EUR. • Internal PSB efficiency gains of 3.5 M EUR. • Re-use department is now run by 1.5 FTE. • Data quality and service delivery enhanced. • Level of professionalism increased.
Met.no	<p>2007</p> <ul style="list-style-type: none"> • Moved to a liberal re-use policy, driven by internal commitment. • All weather data, including most data from ECMWF partners, was opened up for free and anonymous re-use. • A step forward in the value chain, providing full service forecasts to all citizens which thus forced re-users to innovate further. • Actively promoted its re-use philosophy in international fora. 	<p>2011 (cumulative)</p> <ul style="list-style-type: none"> • Downstream effects are significant where the number of unique weekly re-users increased by almost +3,000%. • Met.no serves a need felt throughout Europe (and beyond) since over 40% of re-users are from outside Norway. • Re-users appear to be SMEs that integrate data into their own content services for large groups of users (rather than adding high-resolution value) and App builders. • A direct link with citizens assures the quality of the data (through feedback) and embeds the public business case (and the public funding), thus protecting the developments against any reverse currents.
Spanish Cadastre	<p>Pre-April 2011</p> <ul style="list-style-type: none"> • Until April 2011, there was a high usage of digital certificates (over 4.5 M per year) and online consultation by citizens. Only a few companies purchased data for less than 330,000 EUR a year. • A new download model was introduced on April 5, 2011 which enables mass PSI downloads for free. 	<p>Post-April 2011</p> <ul style="list-style-type: none"> • The new download service introduced in April 2011 was very successful in its first weeks of operation: it already has over 1,152 registered re-users. • The weekly volume of alphanumeric data downloads increased in only one week by +1,900%, from 67 to 1,203, and the total number of downloads of digital maps by +800%, from 275 to 2,101. The total downloads grew by nearly +1,000% from 342 to over 3,300.
UK Ordnance Survey	<p>April 2010</p> <ul style="list-style-type: none"> • Introduction of tiered 'freemium model' of data provision. • The lowest tier of the model provides access to information in four product categories for free at the point of use. (The categories are topographic mapping, address location, route networks and consumer mapping.) 	<p>2011</p> <ul style="list-style-type: none"> • The full impact of changes is yet to be tested empirically. • Re-users suggest wider availability of free data has led more people to use this resource. • Re-users suggest that greater use has led to an increase in the help they provide to assist new users to use the free data effectively.

(3) Downstream effects

This section presents and discusses the downstream effects of lowered re-use charges, i.e. the effects on re-users and end-users of PSI.

Large multipliers

All seven case studies in the table below demonstrate large increases in demand and, where measured, significant impact on the business of private re-users.

Table 11: Selected downstream effects of lowered PSI charges

Case study	Increase
BEV	Number of datasets sold: 200% to 7,000% increase
DECA	Number of re-users: 10,000% increase Turnover re-users: 1,000% increase
Destatis	Number of unique visitors: 1,800% increase Number of downloads: 800% increase
IGN-CNIG	Volume of data services: 200% increase Number of users: 200% increase
KNMI	Number of re-users: 1,000% increase Turnover re-users: 400% increase
Met.no	Number of re-users: 3,000% increase Turnover re-users: more than 200% increase
Spanish Cadastre	Number of downloads: from 800% to 1,900% increase for various datasets.

DeStatis, the German Statistical Office achieves its public task more effectively through a zero cost regime

The German Statistical Office, DeStatis, has gradually implemented a more re-use friendly policy. Since 8 October 2008, all its tables can be downloaded at zero cost and without registration from the GENESIS-Online portal. The free availability of all statistical PSI has led to a substantial increase in data downloads, thereby fulfilling the Statistical Office's public task of wide dissemination of its information. The annual downloads of tables increased from 130,271 in 2004 to 1,092,938 in 2010.

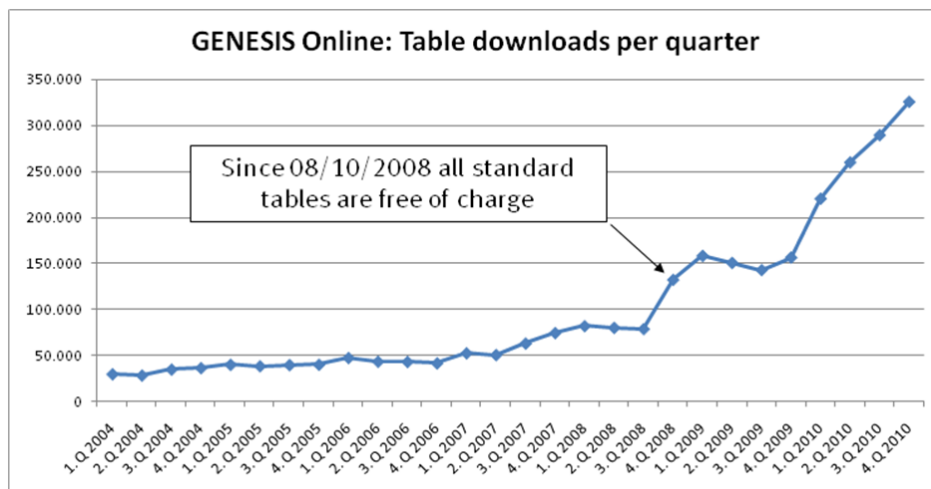


Figure 4: DeStatis' GENESIS-Online database: table downloads per quarter (2004-2010)

Low-end market effects

The low-end market effects are significant. Interestingly, new re-users appear to be content-driven. The 'classic' or more traditional re-users, however, tend to provide tailor-made services to professional clients. These new re-users either build their value propositions on a strong distribution basis or the use of mobile platforms and apps. Revenues are generated through high volumes but low charges (on a price per app basis) or third-party incomes (based on an advertising model). However, revenue could also come from innovative business models. These include apps that build on PSI and are integrated with other data to offer other value-added services.

High-end market effects

The effects in the high-end market appear to be less spectacular, although there are some exceptions. These are most prominent in the meteo sector. In the case of the KNMI, the number of high-end re-users increased by 250%. The Met.no case underlines the importance of non-discriminatory pricing and transparency: the biggest Norwegian re-user (StormGeo) was able to enter the high-end international market for targeted forecasts (for oil rigs and shipping). This market had previously only been covered by the added-value products of the national meteorological offices. This transition occurred after a significant price cut in the full ECMWF dataset established a more or less level playing field. StormGeo has now become a well-established international player. It has nine offices in Europe and the US, and has multiplied its turnover, staff and profit in just seven years. Entry by new providers is bringing enhanced competition in the downstream market, which has beneficial effects on prices for second-tier users.

Lowered charges and improved re-use conditions spark innovation

The lowering of charges brings in new types of users, particularly SMEs (e.g. in the cases of BEV, CENDOJ, IGN-CNIG, KNMI, Met.no and the Spanish Cadastre). In a number of other cases, the price cuts have been less significant or even absent: however, special schemes have been provided for SMEs to stimulate their re-use activities (e.g. DWD, German geo-information PSBs and the planned new DILA pricing model) or improved re-use conditions have been provided (e.g. SIRCOM). The SMEs entering the market tend to introduce new business models and re-use the data available quite differently from the 'classic' re-users.

NAVX benefits from improved re-use conditions and grows internationally



When SIRCOM introduced a pricing and licensing model for its PSI fuel prices in 2009 (re-use was unregulated before), NAVX, a 23 FTE venture capital ICT company active in the field of location-based services, acquired a commercial license right from the very start. NAVX enriches the public data in three ways. It filters out double entries and fuel stations that have gone bankrupt, it adds data for the fuel stations that are exempt from public reporting obligations, and it

improves the precision of the geo-localization. The enriched data are then used for the company's own GPS and smart phone applications and are sold to NAVX's sub-licensees. NAVX focuses on both the B2C business of selling its applications directly to end-users and on the B2B2C business of providing its enriched location-based content to GPS manufacturers, geo-information companies and mobile operators. Building on its strong home market in France, NAVX could expand further to cover at least eight different European countries.

Zero cost provision of PSI by the Spanish Cadastre sparks innovation and improves efficiency

The zero cost provision of Spanish cadastral data means that new geo-marketing possibilities have emerged. There are several examples. SMEs selling swimming pool products have been reported to use cadastral data to target only those houses with a swimming pool, since these data are embodied in their cadastral database. Other efficiency improving re-uses include a faster infrastructure deployment (up to 40% improvement) in the case of the AVE high-speed train. The online real estate service called 'Idealista.com' re-uses PSI from the Spanish cadastral database to identify and describe more accurately properties that are on its online database.

Cascade licensing may ease market entry

'Cascade licensing' implies that the first-tier re-users sell customized sub-licenses to second-tier re-users who can then sell on sub-licenses. It enables the market-entry of smaller players. Such market-based solutions are popular among PSBs as they reduce their administrative burden for licensing and invoicing significantly (examples include DECA and SIRCOM). They may, however, provide some market power to first-tier licensees, notably if the fixed fees are high.

Exploitation of new datasets

The success of smart phone applications which use novel sets of data confirms the potential hidden value of public data. Examples include the retirement plan reports offered by BrightScope²⁷ or environmental advice on housing through use of house registers coupled with additional sets of data by HusetsWeb²⁸. Release data that were previously not valued as useful for re-use by public administrations may attract the attention of developers. For instance, company information, intellectual property and data from official gazettes are currently very rarely opened up, especially in comparison to the abundant use of transport and meteorological data.

Developers look for alternative data sources

In Europe, only a limited amount of meteorological data sets is provided to re-users free of charge. Hence, most of the existing weather-based smart phone applications in Europe are offered by B2B re-users who have already purchased the meteorological PSI for other business purposes (examples include wetter.com, MeteoGroup, meteosolutions and ilmeteo.it) or by the public data holders themselves (such as the Belgian IRM or the UK Met Office). Many developers are not willing to pay for meteorological PSI and have therefore

²⁷ <http://www.brightscope.com/>

²⁸ <http://www.husetsweb.dk>

turned to alternative data sources such as the United States National Oceanographic and Atmospheric Administration (NOAA) which provides weather information (including European data) free of charge to all kinds of re-users on its <http://www.weather.gov/> website.²⁹

Downstream network effects can be impressive

Considerable network effects can arise from making PSI available to re-users at favourable conditions, especially when PSI is placed free of charge on the internet. If information is accessible free to every person who has access to the internet, a potentially enormous pool of entrepreneurs can take and recombine that data with other information. This can enable the creation of new knowledge, products and services that would otherwise not be feasible, for example, if barriers existed in the form of either a high prices or re-use restrictions.³⁰ Furthermore, the new data products created by PSI re-users may then act as inputs for other downstream re-users. They, in turn, add further value to these re-use products by combining them with other sources of data. Complex networks of downstream re-users can thus evolve. This effect applies particularly to PSI which is of an infrastructural nature, such as address data and maps. The DECA case is a good example of this network phenomenon: the number of users of the central register of all Danish address data has expanded phenomenally from the original 26 first-tier distributors, to about 1,100 second-tier re-users. The second-tier users add further value to the data and, as a result, there are several millions of third-tier end-users of global positioning systems (GPSs). The SIRCOM case demonstrates similar patterns in its network structure of PSI re-use.

Clear charging strategies for new PSI sources offer large potential

A special case for potential expansion is the 'new' sources of PSI that are being launched. Quite uniquely, charges can be determined from the outset without any financing legacy. The DECA case and the SIRCOM case demonstrate that PSBs do not need to rely on overcharging levies imposed on re-users.

The DECA case accomplished a clear charging strategy by distinguishing between the public sector investment to be made in the infrastructure and the subsequent exploitation of the facility created. It clearly and concisely allocated the costs to those that benefit. Thus, it maximized the multiplier effects downstream. It underlined the benefits of its initiative for the government and Danish society as a whole, creating a cumulative value of around 57 M EUR.

The SIRCOM case demonstrates that the opening up of PSI to re-users may generate new business models and economic growth. SIRCOM converted the fuel prices at French petrol stations into PSI instead of being just information. At least 24 new jobs were created in SMEs that re-used PSI (as both first- and second-tier users). They created innovative smart phone and GPS applications (a market volume of 1-2 million smart phone applications and 300,000 apps for GPS devices) and value-added B2B services. On the basis of this new source of PSI, two SMEs grew to become European champions in their market segments:

²⁹ Cf. MICUS (2009): *Assessment of the Re-use of Public Sector Information (PSI) in the Geographical Information, Meteorological Information and Legal Information Sectors*, p. 45.

³⁰ Cf. Uhlir (2009): *The Socioeconomic Effects of Public Sector Information on Digital Networks*, p. 19.

they provide services to leading, international geo-information companies such as Garmin, NAVTEQ and TomTom as well as large fuel station networks.

Impact on citizens and re-users has similar patterns

Free access – as opposed to re-use – has similar (or sometimes even stronger) impacts as lowered charges for re-use. Some very large increases in the number of non-commercial re-users, particularly citizens, are occurring. This ultimately leads to positive societal impacts such as democratic involvement and control. Some examples are: DeStatis: an 800% increase of statistical table downloads (in seven years); IGN-CNIG: a 200% increase; and Met.no: a 6,000% increase.

Different dataset have different values

Transport apps (such as public transport information and traffic information) and weather apps appear to be the most attractive types of downloaded mobile apps. Twenty per cent of apps in the travel category surveyed under POPSIS study objective D were based on PSI. Current trends and forecasts indicate that new apps will be more complex and will integrate different sorts of datasets, including more valuable and real-time datasets, and will provide value-added services such as personalization and localization. Citizens concentrate their interest in high value-added datasets, such as public transportation maps and timetables, real-time information, and information that are brought together from different datasets. It is for this reason that geo-location data, value-added datasets, and advanced solutions such as open API would have a large impact on the growth of the PSI-based app market.

There is a definite difference between what is offered on the commercial market (where there is a predominance of weather data and transport data) and what is proposed by the open data community at open data camps or apps contests (on transport and geospatial information, socio-economic statistics and physical property).³¹ This points to the varied needs of consumers in comparison to the more citizen-focused ideas that lie behind apps contests. Nevertheless, apps contests and their results may direct the interest of market players towards previously unexploited PSI datasets.

The unexpected use of PSI stimulated by open data portals and apps contests makes it difficult to establish upfront which datasets have a real market value. Indeed, open data is based on the notion that “the coolest thing to do with your data will be thought by someone else” (a comment by Rufus Pollock). For example, Husetsweb offers a user-friendly tool for homeowners to assess and optimise their energy consumption using the Danish Building and Housing Register (BBR) data coupled with private companies data – Totalkredit (credit rating company) and Rockwool (provider of insulating materials) data on heating sources and potentials for improvements. Therefore, many portals include a ‘suggest a dataset’ feature that can gather further insight from users on which datasets to release in near future.

³¹ This last app is only to be found in the US.

(4) Effects of lowered charges on PSBs

The case studies demonstrate clearly that it is not only the re-users that are affected by changes in charging regimes. These changes often form part of the broader context of a policy change of the PSB.

Lowering charges may increase revenues

All the case studies where PSBs have lowered their prices show that demand grows in relatively larger proportions, sometimes spectacularly. Accordingly, where the price elasticity of demand for PSI seems to be fairly large, the price cuts can continue to contribute to an increase in revenues, especially since current revenues appear to be relatively low. Of course, once charges are zero, revenues will also be zero.

The CNIG is a good example that illustrates that the many small transactions that follow a pricing model change have resulted in a similar amount of income generated, and much more usage. The effect is: many small sales as opposed to a few large sales. In the case of BEV, price cuts of up to 97% in certain geo-information data sets led to increased geo-PSI sales revenues (+46% after four years).

Opening up the re-use potential professionalizes the ties with re-users

In those cases where re-use intensifies, quite often in combination with lowered prices, the re-use facilitation process becomes embedded in the PSB's organization and the relationship is formalized in clear contractual terms (such as service level agreements and contractual guarantees). This alters the business relationship to a transactional level founded on a basis of equality, in which each party has a clear interest in delivering a service. This modification in organization also entails the set-up of various practical means to address the needs of re-users. They include fast connections, FTP-servers and help desk support.

At the same time, in particular when the lowering of charges is accompanied by a reduction in the PSB's own re-use activities, interviewees report a significant reduction in tension between the PSB and its re-users. This can lead to a change in atmosphere which is then more positively built on mutual interest and trust rather than suspicion (examples include KNMI and Met.no).

A more liberal re-use regime brings efficiency gains

The revenues per re-use for FTEs (those PSB employees who are dedicated to the facilitation of re-use) actually increase when charges are lowered for re-use facilitation costs. Clearly, this is caused by the very low number of FTEs needed to facilitate re-use once the decision to further professionalize the relationship has been taken and where tasks and responsibilities are clearly defined.

This development also seems to indicate that the costs incurred in the facilitation of the re-use hardly grow at all – in fact they often ultimately decrease – even if the volume of re-use and re-users increase significantly. Apparently, once the facilitation of re-use processes has been properly organized, the tasks simply become subroutines inside the institution. To a large extent, they are embedded in the public task-funded activities and involve no extra

costs. This also seems to apply to the transaction costs to be incurred when charging for PSI re-use (examples include DECA, Destatis, KNMI and Met.no as well as SIRCOM which outsourced its re-use facilitation activities).

Internal efficiencies surface

Some case studies demonstrate the emergence of a notion that the exploitation of the PSB's own added-value products is in fact inefficient. Due to the rationalization of re-use facilitation, the resources needed to create and market these added-value products (including those to police and protect the downstream market positions) can be identified. They often lead to an economically rational decision to drop added-value products all together (e.g. KNMI).

In Italy, both the Agenzia del Territorio and Infocamere are large organizations with strong internal capabilities to offer services to both final users and public administrations. Re-users claim that the lack of innovation in the market is due to the considerable role played by these bodies in providing value-added services. In fact, the Italian market for re-use is limited and stagnating.

More (re-)use can improve data quality

The intensified ties that are created with re-users have an interesting side benefit. Both PSBs and re-users state that data quality improves as a result. Through this intensified use, data deficiencies are flagged up and reported back to the PSB. Thus, the quality control for the data is partly outsourced when the interest in data quality is shared. Moreover, in those case studies where the PSI is opened up to access by citizens, this relationship becomes a reward mechanism in itself. In the Met.no case, the traditional end-users of the meteorological information produced had proved to be somewhat of an abstraction for the agency. Opening up a direct link with citizens established a new atmosphere. The Met.no employees began to feel an increased sense of importance to society for the tasks they were undertaking. This new approach created a direct transaction model between the PSB and the taxpayer. For Met.no, this association now helps to enhance the delivery of quality data: it receives over 5,000 e-mails a year from citizens who pass on their observations with regard to the organization's performance.

Public visibility can help to lock-in charging regime and public funding after change

The direct and enhanced relationship between the PSB and its re-users has another advantage: It enables the visibility of the (re-)use by society. It underlines more permanently the socio-economic business case and embeds an understanding of the underlying philosophy (and the public funding): thus the financing model grows to be protected against those political currents that may want the reverse it. In particular, in times of budget restraints, central governments may be inclined to desire to return to cost-recovery regimes. (A few interviewees reported that they had encountered such developments, especially after changes in governments.)

Interesting financing models emerge: PSI acts as seed capital

In the IGN-CNIG case, the PSB finances its policy of not charging for non-commercial re-use (which includes use in company management systems) with charges on commercial re-users. This has led to a significant increase in users but not to a drop in PSB turnover. There

are currently over 40 commercial re-users who possess tailor-made contracts. The charges applied are actually based on an estimation of the value-added generated by the PSI in the commercial re-user's business model (the contribution of the original dataset to the final product, the sales figures and the benefit obtained). Moreover, the re-users do not have to pay initial fees, but they need to share the profit once this is made. For SMEs, this has turned out to be an attractive model. Re-users that do not want to reveal their business model can also just pay a flat fee.

The German geo-information PSBs (which apply the AdV pricing guidelines), provide a similar pricing scheme that takes into account the turnover and the value-added to the PSI by a re-user when determining the price to be paid by the re-user: the more value-added by the re-user and the lower the proportion of the PSI in the end product, the lower the percentage of the re-users turnover that is charged as the price of the PSI. Alternatively, re-users may also pay a flat fee.

In both models, PSBs actually benefit from the success of their re-users. They do not, however, receive returns if their re-users fail to create turnover. The models facilitate the entry of SMEs and start-ups into the market since they decrease the business risk as compared to fixed licensing fees.

Conclusion

To conclude, it can be underlined that allowing re-use at low charges has all sorts of beneficial effects. In essence, it:

- pares down the PSB operation and returns it to the contours of the true public task;
- cuts costs (efficiency, transactions, IPR enforcement);
- creates a self-propelling mechanism of data quality control;
- creates better conditions for SMEs to become re-users;
- increases the visibility and use of the PSI for citizens, companies and all types of re-users.

Where the change has led to marginal/zero cost regimes or to models that limit cost-recovery to re-use facilitation cost only, the benefits and increased PSI demand are most evident.

(5) Effects on employment and tax gains

Since there is only a relatively small sample of case studies, their findings cannot be extrapolated to a macro level. The framework conditions surrounding the case studies also differ (such as the actual PSI domains and the countries studied). These two limitations need to be borne in mind when the figures below are interpreted. Nevertheless, the findings have a definite value, since at least three of the same patterns are repeated. These are that growth ratios are correlated, there are potentially high returns and there is a degree of support for previous literature on employment effects and tax gains.

Growth ratios correlate

In some cases, effects on PSI re-use sectors could be observed, in particular in the meteorological market, where the number of first-tier re-users is often limited.

The KNMI case demonstrates that in the eleven years since 1999 following the policy change that entailed the shift to cost-recovery of re-use facilitation costs only, there were significant developments. The number of re-users went up by 1,000%, the turnover increased by 400% and the employment was boosted by 300%. In the DECA case, which also shifted to a re-use facilitation cost-recovery model, the number of re-users went up by at least 5,400%, the turnover by 1,000%, and the employment by 800%.

Although no figures on the increase in FTEs and turnover is available in the Met.no case study (where the re-use charges dropped to zero), the number of new re-users increased from 100 to 3,000 since 2007 (with around 40% re-users coming from outside of Norway). Other case studies show similar, although less spectacular, increases in growth ratios of users and usage. In the CENDOJ case, the number of re-users went up from two to 28 over ten years, and in the IGN-CENIG case commercial re-users increased from ten to 40 in two years.

Thus, the case studies demonstrate a positive relationship between the lowering of prices and increased re-use (both in volume and number of re-users).

Potentially high returns

These increases in employment and turnover also positively impact the gross domestic product (GDP) in the particular country and therefore the tax gains. In the KNMI case, these amount to 35 M EUR over a period of eleven years, and in the DECA case to 14.25 M EUR over nine years. Obviously, at a macro level, these amounts are modest. However, when compared to the investments made and costs, the returns are high. The policy change also yielded PSB savings of 3.5 M EUR in the KNMI case and of 5 M EUR in the DECA case.

The returns are even higher if the benefits of free access by citizens (not only of the re-use) are taken into account. These social and economic benefits were confirmed by studies performed by the Spanish government on the effects of the move to zero costing on the part of the Spanish Cadastre. A 2010 KPMG study³² estimated that the cadastre's online access and digital certifications provision was saving Spanish taxpayers at least 157 M EUR a year, which is much more than the cadastral budget of 118 M EUR in the same year. Another study conducted in 2009 by RSO, CapGemini and CS Transform for the European Commission³³ went much further in its conclusions since its cost-benefit analysis showed that the cadastre's electronic office was saving the Spanish taxpayer about 7,758 M EUR.

Findings are aligned with earlier research on tax gains

Finally, the overall findings on tax gains are in conformity with earlier documentation and studies, as is demonstrated in the text box below.

³² Cf. Álvarez Capón (2010): *Catastro, políticas públicas y actividad económica*, p. 16.

³³ RSO, CapGemini, CS Transform (2009): *Benchmarking Study on impact measurement of eGovernment*.

Quotes on potential tax returns from earlier research

“The private sector has long argued that existing revenue based licensing models for PSI have operated against their interests and those of consumers by impeding the development of new products. Our study is the first to suggest that such models may even be operating against the financial interests of governments. Although governments gain income from the commercial license fees, they lose the taxation and employment benefits from the higher volumes of commercial activity that would be generated by abandoning charges. We find that a conservative projection of a doubling of market size resulting from eliminating license fees would produce additional taxation revenues to more than offset the lost income from PSI charges (...).”

Pira International (2000): Commercial exploitation of Europe’s public sector information.

“Some government agencies are willing to liberalize their policies, but fear that they will suffer budget consequences. Therefore, the relevant government Ministries must come to understand that open data policies will create wealth and tax revenues more than adequate to offset the short term 'losses,' and that they need to fully fund agency information activities.”

Weiss (2002): Borders in Cyberspace: Conflicting Public Sector Information Policies and their Economic Impacts, U. S. Department of Commerce, National Oceanic and Atmospheric Administration, National Weather Service.

“The failure to realize the potential in this market place is costing the national treasuries in the EU dearly in terms of lost revenue from taxation. If the European meteorological market were as well penetrated as that of the USA, then the actual market size would be around 1,390x106 Euro per annum. According to Eurostat the overall taxation return for EU countries in 2005 was 39.6% of GDP. To a first approximation then we might expect that the gross overall tax revenue from this sector would increase by around 340x106 Euro. If, to generate this, the NMHS were to lose all of their income from the sale of PSI, and all of their direct value added retail sales (which are assumed to be diverted to the private sector and are thus still within the total market size), then the net benefit to the EU central treasuries from this change in the trading structure of the market would be in the order of 290x106 Euro per annum and would be, if the US is any guide, growing at about 17% per annum in real terms, rather than at about 1.2% per annum as they now are.”

Pettifer (2008): PSI in European Meteorology – an unfulfilled potential, R.E.W.

“Turning to the question of funding, there is a general proposition that public sector goods and services should be offered at efficient prices, unless there are compelling reasons to depart from efficiency. In the absence of beneficial (or harmful) spill-overs, the efficient price is marginal cost (with supply adapted such that the short and long-run marginal costs are equal). One reason for departing from efficient pricing is that the marginal cost is below the average cost, and that the benefits of a hard budget constraint outweigh the distortionary costs of raising the revenue to make up the short-fall, not from general taxation, but from raising the price of the products supplied. When it comes to charging ‘users’ of public sector information the case for pricing at marginal cost or below is very strong for a number of complementary reasons (note that, for most digital data, marginal cost will be approximately zero). First, the distortionary costs of average rather than marginal cost

pricing are likely to be high because: a) the mark-up to cover fixed costs is high, as marginal costs are such a low fraction of average costs b) the demand for digital data as with other information services is likely to be high and growing c) there are likely to be large beneficial spill-overs in inducing users to innovate new services based on the data, as is evidently the case for other ICT services. Second, the case for hard budget constraints to ensure efficient provision and induce innovative product development is weak for public enterprises not subject to regulation and providing monopoly services without fear of competition. It would be far better to address issues of incentives, regulation and commitment explicitly rather than indirectly through budget constraints. Finally, for several services, the government is already providing effectively a large contribution to fixed costs, without allowing the public to enjoy the benefits of efficient pricing.”

Pollock (2009): *The Economics of Public Sector Information*.

It is important to note that the transition from a cost-recovery regime to a zero/marginal cost model does not constitute a ‘free lunch’ since it may involve transition costs as well as additional public funding for the PSB which cannot rely any more on income from PSI sales. The transition costs and their financing are discussed in section 3.3.2.2. of this report.

3.2.4 PSI charging policies in other countries

PSI charging in both the US and Australia provide interesting comparisons with the situations found throughout Europe.

PSI charging policy in the US

By releasing their materials under non-exclusive, open content licenses, US government agencies have adopted the following policy position that states: by default, PSI that is made available for access can also be used and re-used. The US federal framework is unique in that, under Section 105 of the US Copyright Act, there is no copyright protection for information created by the federal government. This policy typically does not extend to information created and disseminated at the state or local levels.

As a result, US federal PSI promotes economic activity because there are no intellectual property restrictions and no adherence to strict cost-recovery policies. For instance, meteorological information created and shared by the National Oceanic and Atmospheric Administration (NOAA) stimulates economic activity – approximately 700 million US dollars annually – and leads to the creation of other value-added industries.

A 2011 report³⁴ highlights that the US has been active in disseminating and promoting the re-use of its PSI through three recent initiatives: the Data.gov portal, the National Institutes of Health Public Access Policy, and the Trade Adjustment Assistance Community College and Career Training Grant Program. These initiatives, and others, indicate an increasing interest from government and citizens in sharing and re-using PSI.

³⁴ Vollmer (2011): *State of Play: Public Sector Information in the United States*, European Public Sector Information Platform Topic Report No. 25.

PSI charging policy in Australia

Similarly, the Australian federal and state governments are increasingly grasping the social and economic importance of PSI. The Australian Government's Declaration of Open Government reaffirmed the federal government's commitment to this course of action, pursuing "open government based on a culture of engagement, built on better access to and use of government held information, and sustained by the innovative use of technology."³⁵

A notable feature of the Australian experience is the use of open content licenses on copyright-protected PSI (they are primarily Creative Commons licenses). These licenses act not only as an operational mechanism for managing government copyright but also as a driver of information policy and the promotion of web 2.0 tools so as to increase the sharing of PSI through the Gov 2.0 Taskforce. A relevant venture is the Mash-up Australia initiative. It consists of a series of events that brought individuals together to innovate by using government datasets, creating new applications, comparisons, visualizations and demonstrations of how PSI can be used. The Mash-up Australia competition challenged members of the public to demonstrate how PSI can be assembled most creatively and made available online. To support the competition, the Gov 2.0 Taskforce arranged for the release of datasets from over 15 federal government agencies as well as some state and territory governments via a newly created beta data directory, data.australia.gov.au.

3.2.5 Concluding observations

These case studies indicate potential beneficial effects of lowered charges which are manifest in the downstream market, in the PSBs and at the level of employment and increased tax returns.

This triggers the question as to what has brought about such PSI pricing policy changes and why, in certain other cases, such changes are not taking place. These issues are discussed in the following sections.

3.3 Conclusions on the analysis of the case studies

The case studies illustrated in the previous section provide interesting insights into the key enablers and barriers to the adoption of a charging regime that is moving towards re-use facilitation costs recovery or marginal/zero cost regimes. This section summarizes the analysis regarding the change agents which influence such policy developments, and the elements that may help to overcome any obstacles to change.

Sub-section 3.3.1 analyzes the obstacles to PSI pricing policy change, whereas sub-section 3.3.2 states the enablers to change. Sub-section 3.3.3 offers concluding observations.

³⁵ Fitzgerald (2010): *State of Play: PSI Re-use in Australia, European Public Sector Information Platform Topic Report No.13*.

3.3.1 Obstacles to change

This sub-section focuses on elements such as the reliance on re-use revenues (what is called here 'the re-use revenues' reliance trap'), constraints posed by government organizations and financial structures, and the perceived risks of change.

It does not tackle other barriers to the broader perspective of opening up PSI for re-use such as the need for access, changes in culture, how to address fears (like losing control over data and deterioration of the organization's own position as a data holder) or legal uncertainties.³⁶

3.3.1.1 The re-use revenues reliance trap

PSBs may have become reliant on the revenues generated by re-use. Other developments may worsen the situation.

Performance of public task is the key driver

First and foremost, a large majority of the PSBs interviewed do not seem to have principled objections to the lowering of their charges. Their main concern is the proper execution of the public task. As long as the public task – and its financing – is guaranteed, the lowering of charges does not appear to be a real issue in itself.

Reliance on the PSB's own exploitation of PSI becomes a trap

In the last decades, driven by the public mandate, PSBs have increasingly been pushed to recover part of their costs. This is creating a deadlock situation: although the PSBs tend to be sympathetic towards lowering charges and allowing more re-use, their dependency on revenues from the sales of their own raw data compels them to protect their current revenue streams if no sustainable alternative income stream is available.

Own added-value products make things worse

In those cases where PSBs are creating and exploiting added-value products (outside the public task) on top of their own raw data (which is generated inside the public task), the reluctance to move to lower charges is significantly higher. Many re-users have expressed the opinion that, in the event of the market presence of PSBs, this pulls PSBs into the potential danger zone of anti-competitive behaviour. This takes the form of high external charges and highly restrictive re-use conditions in the upstream market (for the re-use of raw data). This is combined with low – allegedly cross-subsidized – charges on the downstream market for added-value products. The absence or the relatively low numbers of re-users in the downstream market appears to be indicative of such situations (e.g. the case of the Dutch Cadastre).

Additionally, the PSI apps market is often distorted by those data holders who decide to develop their own apps. Apps based on PSI that is subject to a cost-recovery regime (such as

³⁶ For a comprehensive visualization of these barriers to change that includes over 100 barriers and solutions, see the summary of the SharePSI workshop 10 and 11 May 2011, Brussels called “Removing the Road Blocks to a pan European Market for PSI Reuse”:
<http://www.flickr.com/photos/epsiplatform/5736210453/sizes/l/in/photostream/>

meteorological data) are often developed and offered by the data holders (or by large re-users) for free. This therefore limits the business possibilities of small apps developers. PSBs increasingly offer their services through apps, and are thereby competing with developers. Not only do the data holders offer their apps for free or at a very low price but they also sometimes decide to change the rules of the PSI re-use in order to protect these apps. Developers mention that it is often more profitable to develop apps for a PSB rather than to try to sell the app on their own.

3.3.1.2 Governmental organization and financial structures' constraints

A number of organizational and legacy constraints may face the PSBs in their efforts to alter charging regimes.

Current charging system creates a legacy

Changing PSI re-use charges does not simply mean putting another price tag on data. It requires a willingness to change existing practices, including processes, infrastructure, organization, procedures, legal frameworks, and most of all the perception of the tasks to be undertaken on the part of PSB staff. Accordingly, the difficulties associated with the change create barriers in themselves, especially where the gains are not immediate or fully certain.

PSBs holding the PSI have limited decision-making powers on charging

Typically, the PSBs concerned have a highly operational and executive task. Their power to make radical policy changes, including large changes in charging for the re-use of their PSI that affects their self-financing capacity, is often very limited or lies instead with a central Ministry. In those cases – even if there is some enthusiasm to lower prices – a hard sell towards the responsible Ministry is often involved.

Buy-in of PSBs is not self-evident

Conversely, where central governments embrace the concept of lowered re-use charges (which lately often takes place in the framework of Open Data policies), this does not automatically imply that PSBs accept this situation. Quite often the policy is not implemented. This is especially so in cases where the PSB has a strong and rather independent position or the policy-making Ministry is not the supervisory body of the particular PSB. The contexts of such top-down PSI policy changes are highly dependent on different national or regional styles of government. For instance, in the Netherlands, more than ten years ago, the PSI policy-making Ministry adopted a very re-use-friendly policy. However, this was never implemented by the large PSB data holders that were not only very independent but were also operating under the *aegis* of other Ministries.

Statutory provisions as obstacles to change

In some countries, such as Austria and Germany, there are statutory provisions that prevent the PSBs from changing their financing models. For instance, under German tax law, the *Verursacherprinzip* (benefit taxation principle) forces PSBs to charge re-users at least part of the data provision costs (*Kostendeckungsbeitrag*). This principle appears to work well, for instance, for levying transit taxes on the usage of roads. However, the question is whether it fits quite as well with respect to the economics of information. Interestingly, heavyweight

incumbent re-users invoke their interpretation of these rules to lobby against free provision of data to all types of re-users (e.g. the DWD case).

Benefits of lowered charges cannot be fully reaped by PSBs

Another aggravating factor resulting from governmental financing systems is that quite often at least a third governmental organization – the Treasury – is involved in the situation. The benefits from the lowered charges come together in the form of increased tax gains. Thus, the gains do not accumulate either with the Ministry that is willing to support the policy change or with the PSB that needs to implement the pricing policy shift in practical terms.

In some countries that operate on the basis of federal structures, these barriers are even more significant because costs and benefits are distributed over various levels of government or geography. For instance, additional corporate tax revenues from lowered re-use charges by the German cadastres, which are operating at *Länder* or even local level, would be consolidated in the main at the central federal level, thus complicating the compensation mechanisms even further.

3.3.1.3 Perceived risks of change

A number of perceptions about the risks of change colour the attitudes of the personnel in PSBs.

Sustainability of financial commitment to change

Lowering re-use charges may initially lead to higher costs and lower revenues, although probably less than PSBs would expect. To the extent that the public task is actually partly financed through returns from re-use charges (and PSBs' own exploitation of added-value products), PSBs will nevertheless need financial guarantees to cover the potential short-term losses incurred due to the policy change, in conjunction with the transition costs themselves. Such costs involve the training of staff, setting up a help desk, changes to technical infrastructure and legal support. These sorts of concerns were expressed by interviewees in many case studies, in particular those where the PSBs were profoundly affected by the re-use revenue reliance trap.

PSBs that are under public scrutiny particularly fear the tendency of central governments to give in to political pressure: they are concerned that they could be forced to move back to cost-recovery before the entire change process has been completed. In particular, data holders with large budgets (corresponding to large public tasks, for instance, cadastres or meteorological offices) are anxious about the risk of falling victim to political fads that advocate tax cuts by cutting their budgets and relying on their own revenues. These trends tend to take place in times of severe budget constraints. In those cases where the annual budgets are, ultimately, decisions negotiated and proposed by the government and approved by Parliament, the PSBs have very limited influence to alter the situation.

Incumbent re-users defend the status quo

Another source of anxiety voiced in the interviews is the tendency of those re-users which have heavy interests in the preservation of the status quo to do everything in their power to prevent the PSB from lowering charges because this may lower entry barriers in the re-use

markets. In particular, re-users that do not add much value to the data themselves, but rather rely on their strong distribution power – for instance in the downstream market of legal content (e.g. the CENDOJ and DILA cases) or in the meteorological sector (e.g. the DWD and Met.no cases) – have been reported to be active in lobbying against and sometimes even litigating to prevent PSBs from adopting lower charging schemes or generally more lenient PSI re-use policies.

3.3.2 Enablers of change

This sub-section discusses questions such as: What happened to those PSBs that actually made the move to a lower charging regime such as re-use facilitation cost recovery or marginal/zero cost pricing? What caused them to change and how did they overcome the obstacles to change? It ends with a series of "What if?" scenarios which examine what would be the costs and benefits of a policy shift towards marginal or zero cost charging occurring.

3.3.2.1 Triggers of change

The public task often provided a driver for change. Yet the policy shift could occur either top-down or bottom-up.

Public task as a driver for change

All the relevant case studies demonstrate that those PSBs that shifted in the direction of lower charges were driven by the conviction that the new model would bring more benefits than the existing one. A more effective performance of the public task was both the starting point and the objective. Interestingly, the real driver was not the perspective of increased revenues – which in some cases emerged as a side benefit – but the notion that serving re-users as part of the public task. To put it differently: the purpose of a PSB makes it highly likely that the interests of re-users are served in the realm of the public task.

Bottom-up vs. top-down

In some cases, the policy shift was generated from the bottom-up; in other cases, top-down. These examples are also referred to as 'selling' and 'telling' models. In the bottom-up cases, it was the PSB holding the PSI that took the initiative (e.g. BEV, Destatis, French Cadastre and Met.no). In many cases, the momentum was driven by inspired leaders in the PSBs who took action within the limitations of the existing framework. In most cases, where the movement was bottom-up, the business case was made upfront to justify the reason for change (what is referred to here as a 'selling model'). In other cases, the need for change was imposed top-down through a clear political decision (the 'telling model'). This is reflected in the cases of the CENDOJ, DECA, KNMI, the Spanish cadastre and the UK Ordnance Survey.

3.3.2.2 Facilitating the transition

Different changes processes occurred. Some consisted of 'leaps of faith' and yet others produced circumstances that were 'eye-openers'. Quite a number of the case studies involved careful financing of the transition.

Some leaps of faith

In most cases where the movement was bottom-up, the business case had to be made upfront, in order to justify the reason for the change. Thus, the costs, the benefits and the financing of the transition process needed to be shown clearly. Sometimes the business case was backed up by market research undertaken (e.g. the BEV, French Cadastre and SIRCOM cases). However, quite often, interviewees acknowledged that, ultimately, there was often a significant 'leap of faith' undertaken: originally, there was no certainty as to the outcomes sought by the change, only a conviction that they were likely to happen and that the action was the appropriate one to take.

Eye-openers

In some cases, interviewees reported that it was only in the process of drafting the transition plan that the actual rationale for making the shift in organization was exposed. It was during this period that the fractional contribution of the re-use revenues was seen and a clearer picture emerged of the gains to be obtained both in terms of efficiency and effectiveness. For instance, in the Destatis case, the revenues from PSI sales were close to the costs of charging and licensing, thus yielding insignificant net revenues for the PSB.

Financing the transition

In terms of financing the pricing policy transition, the bottom-up cases had a more difficult time in finding the necessary resources. Quite often these resources had to be obtained internally or through 'project financing'. As an example, BEV relied on the price effects which generated the means to finance the transition to lower charges.

Conversely, in the top-down cases, the PSBs' negotiating position was somewhat different. In these cases, the PSBs often managed to obtain a form of compensation for the drop that occurred in their incomes, in particular in cases where revenues from their own exploitation of data were of some significance and entailed reorganization (e.g. KNMI and UK Ordnance Survey).

However, in both bottom-up and top-down circumstances, the PSBs interviewed declared that a clear path to transition and the financial means to do so have been of crucial importance.

The table below contains the key aspects of the transition plans of some of the PSBs that lowered their charging regimes.

Table 12: Transition financing measures of selected PSBs

PSB	PSI charging policy change	Transition financing measures
BEV	<p>Before policy change: Cost-recovery</p> <p>After policy change: Cost-recovery (with price cuts of up to 97%).</p>	<ul style="list-style-type: none"> ▪ No additional state funding was provided to the PSB to finance the transition. ▪ The price cuts of up to 97% were financed by increased demand triggered by lower prices (+7,000% of demand for certain data sets). ▪ During the first four years after the policy change, the geo-PSI sales revenues actually went up by 46%. ▪ The relatively low costs of implementing the new pricing model were financed by own resources of the PSB.
DECA	<p>Before policy change: Database non-existent</p> <p>After policy change: Re-use facilitation cost recovery</p>	<ul style="list-style-type: none"> ▪ The Danish municipalities that originally owned the data of the new national address database established by DECA were compensated through a one-off payment as well as the free future use of the DECA database. ▪ DECA received 3 M EUR of state funding to cover the initial investments to be made to establish the national database. ▪ A clear self-financing exploitation plan for PSI re-users was developed. The costs generated by re-use facilitation activities are recovered through re-use charges.
Destatis	<p>Before policy change: Cost-recovery</p> <p>After policy change: Zero cost pricing + Premium accounts</p>	<ul style="list-style-type: none"> ▪ Before the policy change, revenues from PSI re-use were relatively small due to low demand. ▪ The drop in income after the switch to a zero cost regime was therefore limited and was mainly compensated by cutting the administrative costs associated with charging for PSI (e.g. licensing and online shop operation). ▪ No additional state funding was provided to the PSB to finance the transition. The relatively low costs of implementing the new pricing regime were covered by own PSB resources.
French Cadastre	<p>Before policy change: Cost-recovery</p> <p>After policy change: Cost-recovery (with price cuts of up to 97%)</p>	<ul style="list-style-type: none"> ▪ No additional state funding will be provided to the PSB to finance the transition. ▪ The forthcoming price cuts of up to 97% will be financed by the expected increase in demand triggered by lower prices.
IGN-CNIG	<p>Before policy change: Cost-recovery</p> <p>After policy change: Zero cost pricing / marginal cost pricing for non-commercial re-users + cost-recovery for commercial re-users</p>	<ul style="list-style-type: none"> ▪ The costs of providing digital data free of charge to non-commercial re-users could be covered by revenues from marginal cost requests as well as from revenues from commercial re-users. ▪ Due to a positive development of commercial sales and marginal cost requests, the level of income could be maintained at a level similar to prior to 2008 (i.e. many small transactions as opposed to only a few large ones).

KNMI	<p>Before policy change: Cost-recovery + commercial arm</p> <p>After policy change: Re-use facilitation cost recovery</p>	<ul style="list-style-type: none"> ▪ The re-organization of the commercial arm with the aim of privatizing it was financed by state funding. ▪ The PSB further received 0.2 M EUR of public funding for investments. ▪ A clear self-financing exploitation plan for PSI re-users was developed. The costs generated by re-use facilitation activities are recovered through re-use charges.
Met.no	<p>Before policy change: Cost-recovery</p> <p>After policy change: Zero cost pricing + re-use facilitation cost recovery for 'guaranteed delivery'</p>	<ul style="list-style-type: none"> ▪ To finance the transition to a zero cost regime, Met.no received compensation of 125,000 EUR from the Ministry. ▪ Other transition costs (a small amount) were covered by the PSB's own resources.
Spanish Cadastre	<p>Before policy change: Cost-recovery</p> <p>After policy change: Zero cost pricing</p>	<ul style="list-style-type: none"> ▪ The costs of the transition to a zero cost regime are covered by the state budget. ▪ The full budgetary impact of the policy shift (April 2011) is still to be assessed.
UK Ordnance Survey	<p>Before policy change: Cost-recovery</p> <p>After policy change: Zero cost pricing at the point of use for some less granular products + cost-recovery for higher quality products</p>	<ul style="list-style-type: none"> ▪ To enable the 'free distribution' of lower quality data, additional state funding was provided to the PSB by the central government. The amount of additional state funding is confidential. ▪ The full budgetary impact of the policy shift is still to be assessed.

What if? scenarios

The previous sub-section has illustrated how various PSBs successfully organized and financed their transition from a cost-recovery model to another pricing regime that is more favourable to re-users. This sub-section looks at the case studies under POPSIS objective B, i.e. PSBs that operate a cost-recovery model, and asks: "What would happen if these PSBs were to change their PSI charging policy in the direction of marginal/zero cost pricing? What would be the costs and benefits of such a policy shift?"

This analysis is purely hypothetical. It provides an abstraction of national contexts and specificities in the financing structures. This section should under no circumstances be seen as a policy recommendation for specific PSBs or groups of PSBs.

The table below provides an overview of the case studies under POPSIS objective B. It includes their absolute revenues from PSI sales as well as their cost-recovery ratios. The cases are ordered in alphabetic order by country.

Table 13: Cost-recovery ratios of the POPSIS objective B case studies

Country	Public sector body (PSB)	Sector	Total PSI sales revenues	Cost-recovery ratio
DE	BKG	Geographic information	0.08 M EUR	0.24%
DE	SenStadt	Geographic information	0.945 M EUR	10.38%
IT	Italian Cadastre	Geographic information	3.3 M EUR	0.50%
NL	Dutch Cadastre	Geographic information	17.5 M EUR	6.57%
DE	DWD	Meteorological information	2 M EUR	0.93%
ES	CENDOJ	Legal information	1.5 M EUR	16.67%
FR	SIRCOM	Fuel prices information	0.179 M EUR	15.91%
IT	Infocamere	Business register	30.6 M EUR	31.31%
NL	KvK	Business register	47.3 M EUR	19.50%
UK	Companies House	Business register	15.5 M EUR	20.73%

Many PSBs that operate cost-recovery models generate relatively small PSI sales revenues – in absolute terms (total PSI sales revenues) and in relative terms (cost-recovery ratio). It may therefore be argued that the potential costs of lowering PSI charges – mainly a potential drop in PSI sales revenues – are relatively small. Furthermore, the evidence in the previous sub-section has demonstrated that the costs of the policy transition itself appear to be very limited in the case studies that are categorized under POPSIS objective A. On the other hand, many case studies have revealed that lowering charges can lead to high potential benefits such as more economic activity, market dynamism, and innovation as well as improved data quality and PSB efficiency. A policy shift towards lower charges can therefore be beneficial for PSBs and the economies in which they operate.

In the following, the potential effects of a policy shift towards lower charges by PSBs that are currently building on a cost-recovery regime are discussed sector by sector.

In the geo-information sector, all case studies under objective B demonstrate low cost-recovery ratios. In the case of BKG and the Italian Cadastre, the ratios are even below 1%. The highest cost-recovery ratio in this group – 10% by SenStadt – corresponds to a relatively low absolute amount of PSI sales revenues: 0.9 M EUR. A shift to a zero cost pricing regime – as was undertaken by the Spanish Cadastre – would therefore only cause relatively limited costs (loss of income) that would have to be compensated by additional governmental funding. Yet, the cases of BEV and the French Cadastre show that substantial price reductions (up to 97% in both cases) are also possible without any additional governmental funding: the increased demand volumes which can trigger lowered prices may lead to stable or even increasing sales revenues. Indeed, BEV's lowered charges led to demand increases of up to 7,000% for certain product groups. In total, BEV was able to increase its geo-PSI sales revenues by 46% in the four-year period after the pricing review. These very low costs of lowering charges in the geo-information sector appear to contribute to potentially high benefits. All PSBs surveyed in the geo-information sector have experienced increasing re-use of their PSI. For instance, in the case of DECA, the number of re-users went up by 10,000% leading to a re-use market growth of 1,000% over eight years. The development of new re-use activities following price cuts generally leads to economic growth and more

employment, which ultimately results in higher tax revenues. In the case of DECA, it is estimated that the tax gains exceed PSB investment by 400%.

In the meteorological sector, DWD displays PSI raw data sales revenues of about 2 M EUR which corresponds to less than 1% of its total budget. Again, the potential losses from lowering charges may appear to be small when they are compared to the potential benefits. For instance, the free provision of meteorological PSI in Norway and the US and at prices limited to the re-use facilitation costs in the Netherlands has led to the emergence of strong private weather markets in these countries. The additional tax revenues of this economic activity are estimated to surpass the loss of PSI sales revenues. Besides these downstream effects, KNMI and Met.no have reported beneficial effects on their data quality and internal process efficiency. Indeed, through the intensified use of information, data deficiencies are flagged up and reported back to the PSBs. Furthermore, regular feed-back from re-users as well as contractual obligations from licensing agreements have led to more professionalism in the re-use facilitation activities and continuous improvement of internal processes.

All the business registers surveyed operate cost-recovery regimes with relatively high PSI sales revenues and cost-recovery ratios. This goes against the patterns observed in other PSI sectors and can be explained by the specific financing structure of business registers. Typically, business registers do not receive any governmental funding. Rather, they rely on two income streams corresponding to their main activities: (1) fees for registration of businesses and (2) charges for the provision of business information. The two activities generally do not cross-subsidize each other. Yet, there are substantial price differences between different business registers in Europe. While the entire dataset of UK Companies House can be purchased for about 1,340 EUR, each of Infocamere's re-users pays on average 720,000 EUR in licensing fees annually. Some business registers may therefore have the possibility to better exploit the price mechanism.

Lowered PSI prices could lead to additional demand and thereby maintain or even increase the income from information provision services. As experienced in other PSI domains, the increased demand for PSI may have beneficial effects on data quality and service delivery of the PSB due to more and intensified relationships with the re-users. In addition, lowered prices and better access to business information may lead to more transparency in the national economy as a whole. In the downstream markets, lowered prices may reduce barriers to entry, notably for innovative niche players. However, the downstream impacts of a policy move towards significantly lower charges are difficult to predict as there are currently no examples of business registries that provide company information free of charge or at marginal costs.

Hence, it appears that many PSBs that are currently operating a cost-recovery model may be able to benefit from a policy change towards lower charges. More importantly, the economy and society as a whole may benefit greatly from an increase in re-use of PSI.

Indeed, the POPSIS case study analysis indicates that the potential benefits of lowered charges for PSI re-use can be high. Lowered charges can lead to more economic activity, market dynamism, innovation and employment. They may also entail efficiency gains for the PSBs, notably with regard to data quality and internal processes.

Conversely, the potential costs of lowering PSI charges appear to be small. Unless zero cost pricing is applied, the price mechanism may actually increase the revenues rather than lowering them. The costs of a transition to lower PSI charges appear to be relatively limited. This is because, to a large extent, the knowledge and infrastructure needed by the PSBs already exist. The main effort lies in an adjustment of processes and mindsets to serve PSI re-users most effectively.

3.3.2.3 Consolidation of results

Various mechanisms can strengthen the shifts undertaken by PSBs. They include consolidation of the policy change, embedding it in law, and ensuring either self-sustainability or an irreversible character to the change.

Consolidating the policy change

In quite a number of case studies, especially among those moving to marginal/zero cost pricing, interviewees emphasized the importance of the consolidation of this policy change. As a PSB that has moved to zero cost pricing will become fully reliant on tax funding, it is in constant danger: in times of budgetary constraints, politicians may be tempted to lower the tax burden by turning the PSB back into a cost-recovery entity. To prevent that from happening, different complementary consolidation strategies are visible.

Codifying new tasks

Although time-consuming, the safest way to consolidate the new charging model and/or re-use policy appears to be the codification into legislation of the new task. This enables the PSB to create a first line of defence against reverse currents. This approach has been followed in the cases of DECA, DILA and KNMI. In the case of the KNMI it has taken about ten years to finalize the entire codification process.

Ensuring self-sustainability

In some cases (e.g. DECA and KNMI), the provision of data to re-users has become a business case in itself. All costs that are connected only to re-use facilitation are fully recovered (sometimes with a small margin to cover future investments). In these case studies, re-users have expressed their satisfaction with this model, as they feel that the prices are fair and the data quality provided and its delivery is worth the money. In this sense, the re-use policy becomes budget-neutral and it moves away from any perceived danger zone.

Ensuring an irreversible shift

Another complementary strategy is to secure the new charging model by establishing close ties with the clients to be served. This creates a 'need to have' character to the service. For instance, in the Met.no case, the free re-use model was combined with a step forward in the value chain to deliver detailed weather forecasts to society for free. Hence, the socio-economic business case was enhanced and the underlying philosophy (and the public funding) was protected by a 'human shield' that consisted of millions of visitors a week, including thousands of re-users. There are some parallels to be found with this strategy in the Destatis and DWD cases.

3.3.3 Concluding observations

In short, the most fundamental barriers to policy change are of financial, organizational and psychological characters. More specifically, they include the re-use revenues reliance trap, power and internal financing models, and anxiety with regard to a number of risks. A sound plan for transition including the financing of the transition process, a smart consolidation strategy and, most of all, the courage and the belief that re-use facilitation is part of the public task are needed to overcome these barriers.

4 Apps market snapshot (D)

Strong growth of the apps market

The **mobile app market has started to stabilize and has become a mature business for two leading app stores** – in 2010, after two years of development, Apple and Android generated annual revenues of \$ US 1.8 billion and \$ US 100 million respectively. Growth is expected to continue and increase, based on the increasing spread of smartphones and internet mobile access, reaching expenditure of \$US 35 billion in 2015³⁷. This is due to high numbers of Apple iPhone sales (expected to reach 15.7% of the smartphone market in 2011) and the widespread presence of the Android system on different smartphones (expected to have 39.5% of the market in 2011). The **Europe mobile app market is expected to become the world's largest in 2015** with a 30% share of the global market.

High app downloads numbers and app store revenues have not translated into widespread business opportunities and employment growth in the sector yet

The **predominance of free apps** among the top downloads (81% according to Gartner) as well as the **low number of applications per developer** result in low average revenues for each developer (around \$US 3,000 per year). Thus, **powerful app stores revenues and download figures do not have a significant impact at this stage on employment growth** in this sector.

Lessons can be learned from the web. Focusing on short-term monetization might not be a successful strategy for PSI and apps. Revenues could, of course, be generated in the longer term. Looking only at **short-term market revenue generation could lead to a significant underestimation of the longer-term impact of the apps market**, just as if Facebook were to be valued based on its 2006 revenues.

Substantial proportion of apps is based on weather and transport PSI data

Apps popularity rankings suggest that **PSI-based applications already possess a significant share of the total apps market** thanks to the popularity of **transport and weather apps** (which are based on PSI). Nonetheless, the majority of the most popular apps today are games (61% of all downloaded apps in the US according to a Nielson Survey).

Apps contests show the hidden value of less commercially explored PSI data

Apps contests have been hugely successful in **generating attention** and real action to **illustrate the potential benefits of open PSI**. A typical open data contest attracts about 40 functioning apps for a prize of about 20,000 Euros. There is increasing attention paid towards smartphone apps that so far attract the interest of 20% of contest participants.

Developer interviewees' thoughts about the drivers for PSI-based apps growth

Rapid innovation: There are few upfront costs needed to develop apps. Developing an app is a great way to gain visibility with users and other groups such as venture capitalists. The most important driver is to “fail fast” and ensure rapid understanding of user needs and

³⁷ <http://www.marketsandmarkets.com/Market-Reports/mobile-applications-228.html>

market dynamics. Therefore developers are assisted by **easy and free access to raw PSI data** which enables them to experiment with different datasets.

Experimenting with the business model: One can observe the increasing popularity of freemium model combined with advertisements and in-app purchases. Furthermore, venture capital investment is needed to provide enough room for business model experimentation. The development of new business models entails freedom from some upfront costs associated with PSI (especially yearly fees) that prevent the developers from investing in PSI-based apps due to **high costs of obtaining the right to data and complicated licensing schemes**.

Need for stable PSI re-use rules: Stable rules for PSI re-use are an important factor in guaranteeing market growth as they support the emergence of stable business models.

Barriers to the successful development of the PSI-based app market

The unique price per app model is in conflict with yearly license fees: The high licensing fees of some PSI make it difficult to create profitable apps. Therefore, developers choose open alternatives. To provide geo-location data, some developers have used the free wiki world map provided by the OpenStreetMap project³⁸.

Changing rules of the PSI market: The changing rules for PSI re-use, as well as changing prices, can hamper app company growth as developers' business models rely heavily on PSI pricing, rules and stability.

Heterogeneous data format: The cost of gathering and cleaning public data published in different formats increases development costs.

Data holders entering the app market: Those data holders who decide to develop their own apps often distort the PSI app market: Firstly, because they are able to offer them free or for very low prices and secondly, because they often decide to change the rules of PSI re-use in order to protect their apps.

If data are free, why pay for an app?: Users are reluctant to pay for an app based on free PSI data that just offers access to a single type of data. In accordance with the overall trends on the app market, **PSI apps have to integrate different datasets and create added-value to persuade their customers to pay for the service**.

³⁸ <http://www.openstreetmap.org/>

5 Open Data Portals (E)

Portal structure and budget

The portals are initiated and run by different tiers of government or agencies. The **crucial factor for success is the presence of high-level political commitment**, such as in the US and UK. Nonetheless, many portals are still championed and developed by one or a small number of committed individuals.

Portal **budgets vary considerably** from US \$ 9.2 million spent on data.gov to a few hundred thousand Euros allocated on average for European national and regional initiatives. **Long-term funding is important** because it allows portals to plan ahead for the release of new datasets and capacity building activities.

The portals **differ in structure**, most of them are developed as data repositories, but some of them are also web directories.

Licensing schemes

Most of the European portals are based on a **Creative Commons license**, whereas the US portal makes data available with a free license. **France** and the **UK** developed their own **bespoke licenses**.

All data on the portals are free and were free before publication. The portals do not directly imply that there should be changes in pricing policy of datasets, but they **help to make the case for free or marginal costs PSI**.

Capacity building and user engagement

Data catalogues are often part of a **wider strategy of raising awareness** about open data re-use and community-building activities. Initiatives (e.g. apps contests) enable continuous dialogue with re-users.

Ranking and rating systems and collaborative tagging enable more user engagement and identification of valuable datasets.

Data value

A **low-hanging fruit strategy is prevalent** (using datasets that are already available and are easy to open up), although UK and US portals ran data value analysis studies beforehand. Still, the low-hanging fruit strategy is very efficient as it enables the launch of a portal, which can be complemented with further datasets later.

Most of the portals do not release datasets that are already considered as valuable for the market (such as meteorological data, geo-localisation, or business registers). The value or uses for data are not always clear to government prior to release. However, open data portals can produce some valuable and **unexpected uses of the data**.

Supply, uptake and impact

The **number of datasets**, although simple to gather and compare, is a **poor indicator** of the Open Data Portal's overall quality. Data.gov and data.gov.uk collect thousands of datasets while other portals have collected fewer than one hundred.

Portals with a "**suggest a dataset**" option produce very important information on what is really sought by citizens and open data applications' developers. It can also be used to measure users' interest in the data.

Most of the portals offer anonymous and fairly non-discriminatory access. Unfortunately, this **easy access approach** (often operating across a large number of government departments or agencies) **limits the ability to record downloads** and the metrics that can be used to evaluate take-up.

The **metrics used** by the portals **vary greatly**: the UK and US report around 100,000 visits per month, while regional initiatives have about 3,000 unique visitors. A few portals publish their website visit data. Download data are less available but vary from 320,000 for the US to several hundred for regional initiatives.

The **developers' take-up can be measured only by the number of the apps reported on the website**, since the portals almost never require registration. There are many more apps developed than the numbers cited by portals since they cover only those of which the portal manager is informed. The US reports 940 apps, the UK 140, while other portals have much lower numbers.

The **impact on end-users** should be taken into account when measuring the portals' success. Many apps have been successful in addressing new needs, such as offering better information on traffic or crime or more effective planning of working days. While the number of apps developed is not overwhelming at this stage, and they are seldom monetizable, every portal has stories of apps and services which are in high demand because they solve a real problem that was previously not addressed. This is arguably the **greatest impact of open data portals** but these societal benefits are **much harder to estimate** and **even harder to quantify**.

Critical success factors

The **transparency agenda** in the Anglo-Saxon countries and **the innovation push** in Scandinavia are the most important drivers of activity for open portals.

High-level political commitment proved to be a very important driver for the portal initiatives.

The **open data movement** was also a very significant stimulus for governments' projects.

UK and US portals' launches have inspired other governments to create open data portals.

The **PSI re-use directive** has **not** been an influential driver for the portals studied. Nevertheless, the interviews showed that there are expectations that the future revision of

the Directive will put more pressure on European governments to release more datasets and to reinforce the initiatives already carried out.

Apps contests often triggered the portal initiative.

PSI-based apps make a case for open data portals but the apps have to be sustainable and business viable in order to interest the app developers. The successful apps examples show that PSI data have to be coupled with other datasets and there is an urgent need for novel datasets.

Last but not least, a salient factor was the **advent of web.2.0, mobile apps and data visualisation tools**.

Barriers to portals development

Data portals will probably face **budget cuts** due to the current financial crisis but also after their launch budget runs out.

Lack of middle-layer engagement, i.e., the civil servants in data holders' PSBs, hampers rapid release of further datasets.

PSBs' data quality and the lack of budgets to clean data also have a negative impact on data re-use although it leaves space for commercial services.

Lack of analysis of the socio-economic benefits of different data types makes it difficult to prioritize the data sets to be released and to argue for further data release.

Impact so far is only measured by apps and traffic. The risk is that open data portals appear to be a useful tool for developers, while the real beneficiaries are final users (both citizens and companies).