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"Foresight process impacts: Beyond any official targets, foresight is bound to serve democracy"

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ABSTRACT

Foresight is usually criticised for having a limited direct impact on policy-making. Although contexts play a significant role, this may be true to a certain extent. It is also true, however, that the value of foresight has been under-explored. The purpose of the paper is to show the value of foresight in contributing to the development of more participatory societies irrespective of the specific 'official' objectives it is designed to serve. The methodology included the creation of a specific impact assessment framework and the assessment of certain foresight exercises (FNR Foresight and eFORESEE Malta) in terms of contribution to more participatory societies through case studies. The assessment showed that although contributing to more participatory societies was not among the main aims of the particular exercises, they managed to achieve certain impacts facilitating increased public participation or directly improving democratic processes in policy-making. Foresight is 'by default' devised to promote democratic processes through inclusiveness, openness, transparency, public engagement, and multi-stakeholder approaches.

1. Introduction

Foresight enjoys several definitions that do share certain key elements. Foresight is primarily concerned with exploring and designing for the future. In doing so it considers alternative futures, and requires creative thinking and multi-disciplinarily perspectives encouraging a proactive and path-breaking perspective. In generating knowledge it adopts interactive and participatory approaches thus enabling collective learning (Barré & Keenan, 2006) while also forging new social networks and supporting deliberative democracy (Georgiou,Cassingena Harper, Keenan, Miles, & Popper, 2008). The anticipatory intelligence generated is translated into scenarios or shared visions, the joint articulation of which enables alignment of diverse needs and motives of different actors and commitment to the realization of the visions. (European Foundation, 2003) Foresight does not stop to the exploration of the future ending with the formation of scenarios or joint visions. It is further associated with the definition of strategies and actions in responding to upcoming opportunities and threats as expressed within certain scenarios or in pursuing shared visions. Thus, foresight is seen as an action-oriented instrument for policy-making (Havas, 2005). These major characteristics governing foresight can be grouped in three major building blocks as follows:

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- Building networks: as a process of co-production of communities of stakeholders and as an instrument of transaction, dialogue, negotiation, cooperation and alignment among them;
- Building knowledge: as leading to the development of strategic visions and anticipatory intelligence considering alternative futures based on a multidisciplinary base and through evidence-based approaches, interactive and participatory methods of analysis and collective interactions enhancing collective learning;
- Building participation and action: as bringing more stakeholders and points of view into the decision-making process with an orientation to inform present-day decisions, coordinate agents and policies and shape behaviours and routines in view of taking concrete actions towards the realisation of a jointly defined future vision.

The above characteristics bring several challenges in foresight operation and delivery of impacts. Wide participation brings tensions from considering both 'expert' and 'non-expert' knowledge as well as across notions of 'participatory' and 'representative' democracy (Barré in Tübke, Ducatel, Gavigan, & Moncada-Paternò-Castello, 2001). It also brings the challenge of getting commitment and interest of a wide range of stakeholders and of handling controversial and divergent opinions.

Another challenge relates to foresight impacts on policy-making which has been less than anticipated. (Havas, Schartinger, & Weber, 2010; Havas, Schartinger, & Weber, 2007; Webster, 1999) This challenge has to do with translating shared collective problem-perceptions, expectations and visions into concrete decisions for policy making. It also associates with the different time frames between policy-makers, who usually have to deal with short-term urgencies, and the long-term perspective and holistic thinking that foresight encompasses. Responding to such challenges, Eriksson and Weber (2008) have developed the concept of "adaptive foresight" bringing together foresight and adaptive planning. Adaptive Foresight offers a more modest interpretation of the collective ability to "shape the future" and stresses the need to adapt to actions by others. Following the principles of adaptive planning, it considers whether strategic decisions should be deferred until more information is available and whether to invest in (real) options which would facilitate the implementation of such decisions. However, Adaptive Foresight faces a range of challenges. More specific and differentiated guidelines are needed that build on a broader range of practical experiences and thinking in terms of real options in the context of foresight is still in early stages of development.

Despite the various issues in the implementation of foresight results, policy-makers consider foresight as a useful approach. In the 1990s only of handful of European countries like the UK or Germany, following the example of Japan, were running national foresight programmes. The following years, however, have seen an explosion of foresight exercises that led to a wide spread and application at the regional, national but also the international levels. As an indication the European Foresight Platform[1] running until 2012 recorded over 250 policy briefs on foresight exercises around the world.

Yet, the value of foresight has not been adequately explored. The purpose of the paper is to show the value of foresight in contributing to the development of more participatory societies. This is done through the assessment of specific foresight exercises irrespective of the specific 'official' objectives they may be designed to serve.[2]

The argumentation unfolds through five sections. The next section (Section 2) discusses the wide range of foresight impacts and presents a classification of them based on the main foresight functions. This analysis reveals that impacts related to democratic processes span across all foresight functions although the third foresight function may be more directly relevant. Section 3 then touches upon the challenges in foresight evaluation. Considering these, Section 4 then presents a specific foresight impact assessment framework and the methodology of research upon which this paper is based. This comprises the application of the suggested assessment framework in the assessment of two foresight exercises through case studies. Section 5 presents the results from the case studies, while section 6 discusses the significance of the results in relation to participation and democracy and draws consequent conclusions.

2. A wide range of foresight impacts

The types of foresight impacts reported in the literature span from more concrete ones like building networks and shared visions and strategies to more generic types, rather intangible and needing time to materialise, like increasing strategic intelligence, formulating forward-thinking, enhancing strategic capabilities and facilitating knowledge creation and diffusion by setting in motion learning curves. (Calof & Smith 2012; Barré in Barré & Keenan 2006; Cassingena Harper 2003; Tübke et al., 2001)

Drawing upon socio-economic and research programme evaluation terminology, foresight impacts are usually divided in immediate, intermediate, and ultimate impacts. The FOREN guide (Gavigan et al., 2001) defines foresight immediate impacts as the formal outputs that have been achieved (e.g. reports produced and circulated, meetings held and attended, etc.). Intermediate impacts are effects such as new networks, changes in attitudes and behaviours, incorporation of foresight methods or results in other than participating organisations, while ultimate impacts are of even more aggregated and general nature like overall system performance judged against the overall aims of the foresight exercise.

[1] http://www.foresight-platform.eu/briefs-resources/.

[2] This work was the subject of the PhD thesis titled 'Assessing the contribution of Foresight towards more participatory, 'knowledge societies" submitted to the University of Manchester and successfully completed in December 2011.

At the same time, several scholars highlight the importance of the impacts stemming from foresight processes. These may include network building and collective learning (Belis-Bergouignan, Lung, & Heraud, 2001; Barré & Keenan, 2006; Havas, 2005) social learning, development of new and potentially long lived networks of stakeholders, who may not otherwise have come together, joint learning about foresight processes and ways to manage interactions among stakeholders with possibly divergent objectives (Tait & Williams, 2003), socialisation and awareness raising effects (Durand, 2003) or network re-alignment and research and innovation policy updating (Havas, 2005).[3]

Foresight is a valuable tool for the management of knowledge flows (Webster, 2002). By contributing to the collective learning process of the actors involved, foresight can help achieve a better match between the external environment and the internal capabilities of the actors, thus improving their adaptive behaviour. The value of foresight in creating an infrastructure for 'distributed' intelligence to better address future challenges is also highlighted and is the creative and visionary aspects of foresight (Warnke & Heimeriks, 2006). Havas, et al. (2007) highlight the cross-boundary nature of foresight which enables linking research and innovation processes more closely to socio-economic needs. The strategic value of foresight is also praised especially in combination with managing uncertainty (van der Meulen, De Wilt, & Rutten, 2003). Brown et al. (2001) also agree that foresight is important across organisations as it can have a large impact by creating new innovative relationships.

Georghiou and Keenan (2006) stress that the role of foresight has been increasingly emphasised as a process-oriented innovation policy instrument with the policy benefits shifting from the delivery of information on future developments as a basis for priority setting to the mediation of self-organisation among actors of an innovation arena. Impacting policy decisions is an important outcome for foresight (Calof, Miller, & Jackson, 2012). Cagnin and Johnston (2011) claim that the initial and subsequent policy positioning of foresight may not only be facilitating policy-related impacts of foresight but form a key factor of success for the foresight programme.

The above is only a fraction of the different types of foresight impacts reported in the literature. Several attempts have been made to classify the different types of foresight impacts, which in fact share several commonalities. Following the three main types of impact of social science research, Johnston (2012) categorises foresight impacts into four categories of impact – awareness raising, informing policy, enabling greater capacity to address uncertainty, and influencing policy, strategy, investment, program delivery and public attitudes. Calof and Smith (2012) specify five distinct sources and types of foresight situations that produce policy-related foresight impacts:

1. Value statements – as perceived or experienced by key players and stakeholders, expressed in general or specific terms, usually as a testimonial or anecdotes, sometimes accompanied by case highlights;
2. Roles that foresight plays in the public arena i.e., in raising awareness, educating and influencing decisions and decision-makers, evaluating related program performance, robustness of policies or in enabling direct action especially where these are unique roles;
3. Success factors: how foresight can design its projects and operational priorities and profile to ensure its results are timely, meet stakeholders' needs and hence maximize their impact potential by employing measures which motivate and satisfy government managers and executives;
4. Process and knowledge benefits: how foresight outputs in new knowledge areas and capacities required can facilitate agility, open up the scope of stakeholder awareness and strategies etc.;
5. Policy interface: how foresight can help policy formulation, positioning for delivery, implementation and action by co-managing forward engagement messages, and foresight insights and results that show or validate societal change and direction often in a dynamic, multilateral structure.

In an attempt to produce a foresight impact classification considering all previous endeavours and also the wide range of possible foresight impacts, Amanatidou (2011, 2014), concludes on three main groups highlighting the three main roles of foresight in relation to a) informing policy, b) networking and collective learning and c) public participation. This formed the basis for developing the impact assessment framework for foresight exercises that is presented and tested in the following sections of the paper.

These three functions are not excluding each other. Yet, each one is differentiated from the others by specific features that are of more crucial importance to them than the other functions. The first function primarily aims at supplying anticipatory intelligence in directing policy. This may indeed be an aim of the two other functions as well. The differentiating feature here is that the primary focus is the production and provision of anticipatory knowledge itself. The emphasis is not on the networks and coalitions built in producing and implementing it (which is the focus of the second function) nor on bringing new and diverse actors in the debates in improving inclusivity, transparency and legitimacy (which is the focus of the third function).

The emphasis of the second function is on the networks and coalitions built around shared future visions and the consequent collective learning taking place within them. Facilitating networking also helps embed more stakeholders' view

[3] Undoubtedly, there are several other practices, outside the foresight field, leading to similar outcomes. Without any intention to limit their value the focus of the paper is on the foresight processes and methods which aim to explore and design for the future through a co-productive, collective and multi-stakeholder approach, thus leading also to impacts like networking, or collective learning.

in policy-making, thus making the second and third functions look similar. However, it is the diversity of the actors engaged as well as the primary focus in improving governance by supporting inclusiveness, transparency and legitimacy that differentiates the third function from the second. In reality foresight programmes usually serve more than one functions at the same time but to different extents. (Amanatidou, 2014)

These three major foresight functions are also characteristic in terms of the impacts they may lead to. The 'informing' foresight function leads to knowledge-related impacts, the 'facilitating' function stresses impacts associated with networking and collective learning, while the 'embedding' function primarily addresses public participation. The third foresight function seems the most relevant and directly leading to impacts related to increased public participation in decision- and policy-making. Indeed, impacts in this group include a strengthened role of society through the intensification of public debate, deepening of dialogue with society, building of policies on societal debates, or orientation of innovation to societal needs. This group also refers to impact of improved governance, i.e. transparent, open, participatory, legitimate governance with broadened participation leading to a democratic renewal. (Georghiou & Keenan, 2006)

Nevertheless, there are several impacts in the second foresight function also that can be considered as pre-requisites for increased engagement of actors beyond the 'usual suspects' in policy deliberations. These refer to improved system actors and inter-actor relations, through trust building between system actors, improved communication and collaboration, links/networks across diverse groups, new networks and strengthened communities, or empowerment of (new) actors. The first foresight function also includes impacts related to building strategic thinking/vision building capabilities which are important to have when on board strategic discussions and decision-making. (Amanatidou & Guy, 2008; Amanatidou, 2014; Barré & Keenan, 2006; Havas et al., 2010; Keenan, 2007; Ladikas & Decker, 2004; Warnke & Cagnin 2007)

3. Challenges in foresight evaluation

Despite the emergence of foresight as a key policy decision-making tool over the years, the evaluation of foresight endeavours is still an under-researched field. The limited attempts for thorough evaluations of foresight processes and impacts can partly be attributed to the challenges and problems facing foresight evaluation. The range of situations in which foresight is applied is significantly wide, thus hindering the development of a "one-size-fits-all" evaluation approach (Georghiou & Keenan, 2006). Several of the benefits considered to accrue from foresight are intangible, and thus quite difficult to assess, while they may be dispersed across a landscape of actors and systems. The still young area of foresight evaluation also suffers from lack of appropriate indicators, while it also faces problems common with the field of socio-economic and research programme evaluation, such as the problem of attribution of impacts due to the long time needed for them to materialise, making the tracing back of cause-effect relationships extremely difficult. (Barré & Keenan, 2006)

However, certain attempts have been made in improving practices in foresight evaluation. While looking at learning impacts of foresight from the perspective of how they can lead to the development of strategic alternatives through networking, Schartinger, Wilhelmer, Holste, and Kubeczko (2012) offer an evaluation framework using social network analysis as a method for mapping out networking effects in a large foresight process. Drawing on the work of three generations of foresight impact research (Georghiou, 2001), Johnston (2012) establishes a framework for evaluation starting with identifying four broad types of foresight impact: awareness raising, informing, enabling and influencing. Depending on the objective of the foresight exercise (which of the four impact elements are part of the foresight plan), different impact metrics are proposed.

At the same time, Miles (2012) warns that comparison of foresight activities needs to bear in mind the different scale, scope, and ambitions of different programmes, and that a simple static comparison of formal inputs and outputs will miss much of the value and value-added of the activity. For Miles (2012) as well as for Johnston (2012) it is important that the evaluation is guided by the programme's objective. Yet, Miles challenges the concept of measuring foresight only in terms of policy-related impacts as there are several different roles for foresight that call for a more dynamic evaluative approach.

4. Material and methods

Considering the above developments in foresight evaluation, i.e. starting with the foresight functions that reflect anticipated impacts but also giving emphasis on all different foresight impacts, rather than only the policy-related ones, a new impact assessment framework for foresight was built in Amanatidou (2011, 2014). The research where the present paper is based on came from the application of the specific assessment framework in two foresight exercises, i.e. FNR foresight and eFORESEE Malta.

The specific framework presents a novelty in relation to previous frameworks. While the others focus in assessing impacts against the pre-set objectives of the specific foresight programme, this framework explores impacts in a broader area, that of contributing to building more participatory, knowledge societies, thus following Miles (2012) suggestion to be more explroative in foresight evaluation. This framework was built around the three main types of foresight impacts identified in Amanatidou (2011, 2014) that reflect the three main roles of foresight in relation to a) informing policy, b) networking and collective learning and c) increasing public participation. The framework also draws upon possible impacts that may not have been targeted in foresight exercises – these are called unintended impacts. The identification of these impacts was based on the review of available literature about the pre-requisites and conditions that have to be in place to increase public participation in modern societies. Considering both intended and unintended impacts, Amanatidou and Guy (2008)

concluded that foresight exercises may strengthen certain features that can make modern societies more participatory and knowledge-driven as follows:

- By facilitating knowledge creation, absorption and diffusion;
- By strengthening social capital and networking; and
- By encouraging the alignment of actors interests, their active participation in dealing with uncertainty, and by creating more informed and concerned publics.

The framework also takes into account that there are specific factors that affect the course of foresight exercises, to a lesser or greater extent in any of the functions the exercise may serve – these are called 'horizontal' factors. These horizontal factors are separated into internal and external to the foresight programme. The former, i.e. the internal factors or the so-called 'programme factors' refer to 'actors', 'processes and methods', 'inputs/outputs' and 'objectives' of the foresight programme. The latter, i.e. the external factors or 'non-programme factors' refer to the external environment and specifically to the 'institutional context', 'structures and state of innovation systems, "socio-cultural", and 'governance' features. (Amanatidou, 2014)

The impact assessment framework uses the concept of the 'foresight programme theory' and matrix (Funnell, 2000; Rogers & Bozeman, 2001; Weiss, 1997). The foresight programme theory is essentially the assertions that underline the foresight programme's design and operation, thus explaining the mechanisms of delivery of impacts. The framework unfolds around three main tasks: a) the structuring of the 'foresight programme theory' matrix with the 'horizontal' elements, i.e. internal and external factors/criteria and associated indicators, based on information about how the specific exercise was designed, organised and expected to deliver the intended impacts;

b) supplementing the 'foresight programme theory' matrix with the 'function-specific' elements, i.e. achieved intended impacts but also alternative/unintended impacts that might have emerged, associated indicators and any additional factors that might have been responsible for their emergence;

c) comparing what actually happened vis-à-vis the way things were designed and expected to happen, as well as vis-à-vis what else happened or could and should have happened based on relevant accumulated knowledge in the available literature about the conditions for developing more participatory, knowledge – driven societies.

As a result, the new framework prescribes assessment of a foresight exercise at three levels:

- at the level of the 'foresight programme theory',
- assessment of the Foresight Value Alliances (FVAs) created and
- assessment of the impacts both intended and unintended in terms of contribution to more participatory 'knowledge societies'.[4]

Drawing upon the concept of 'knowledge value alliance' (Bozeman & Rogers, 2002) a 'foresight value alliance' (FVA) is defined as a specific group of people brought together under each distinct activity of a foresight exercise (like expert panel, or Delphi survey, or scenario workshop) for the specific purpose of creating knowledge and using it within the FVA or across different FVAs under the specific foresight exercise.

This concept is used as the evaluative unit of analysis. The definition of an FVA as the unit of analysis was decided on several grounds. It reflects the importance of the participatory structures of foresight exercises and gives adequate attention to the value of knowledge creation, collective learning as well as networking and collaboration. At the same time it addresses human capital development (i.e. capacity/skills/qualifications building) which is of equal importance in foresight exercises along with the related impacts at individual level.

The new framework was applied in specific foresight exercises through case studies. The case study methodology followed the stages, steps and guidelines of the assessment framework. Out of the three extended case studies that were carried out, the results of two of them are reported here being the most relevant to assessing foresight's contribution to enhanced public participation. The first foresight exercise was FNR Foresight which ended in 2007 and the second one was the eFORESEE Foresight exercise carried out in Malta (2002). Both are described in detail in the following section.

FNR Foresight was chosen for a real impact assessment exercise based on the developed framework. The methodology of data capture for the FNR Foresight case study included desk research (foresight programme documentation, relevant reports and papers as well as literature describing the broader socio-economic and governance contexts) and also twenty interviews with programme managers, clients and participants. The methodology for the eFORESEE Foresight case was mainly based on desk research of reported impacts and three interviews with selected participants.

[4] Given that the focus of the paper is to show the contribution of foresight to increased public participation, the results of the case studies will mainly concentrate of the third level of assessment, i.e. assessment of the impacts both intended and unintended in terms of contribution to more participatory 'knowledge societies'. First the achievement of the intended impacts is discussed followed by the achievement of unintended impacts based on the interviewees' value judgments. Although the framework prescribes the study of both intended and unintended impacts these are not conflated with each other. The study of unintended impacts follows the intended ones based on a review of available literature answering the question "what else is there that could have been achieved in the specific case?"

Interviews in both cases were based on two templates, Template A for the organisers, consultants and clients of FNR foresight and Template B for the participants of the exercise. Template A consisted of five sections: a) the foresight programme basics, i.e. the rationale, key objectives and relevant foresight functions and methods, b) internal and external factors affecting the course of the exercise and the associated hypotheses for the expected mechanisms of delivery of impacts, c) the FVAs created and the relevant impacts from their creation and participation, d) foresight direct impacts, and hypotheses about the expected mechanisms of delivery and e) foresight possible unintended impacts and their possible mechanisms of delivery.

The structure of Template B was slightly different and 'lighter'. It started again with the basics but then focused immediately on the impacts with those related to participation in the FVAs first. Then the expected impacts were examined in detail with the associated affecting factors (hypotheses about the mechanisms of delivery were omitted). These were followed accordingly with the possible unexpected impacts and possible important factors.

The approach that was applied in analysing the evidence gathered was 'explanation-building' (Yin, 1994). The analysis of the case studies gave primary attention to describing the key features and 'facts' as well as the necessary pre-conditions governing them. Conclusions focused on the validity of the hypotheses as well as the degree to which the suggested impact assessment framework was applicable in the specific cases. The reports including the results of the assessment of FNR foresight and eFORESEE Malta based on the new assessment framework were sent to the interviewees for comments and approval.

5. Results

5.1. The case of FNR foresight

5.1.1. Foresight rationale, key objectives and functions

FNR Foresight was a foresight exercise organised by the National Fund for Research (Fonds National de la Recherche – FNR) in Luxembourg. It was carried out between 2006 and 2007 by FNR, in association with the Ministry of Culture, Higher Education and Research. The main aim of FNR foresight was to identify new research domains to support when the first cycle of FNR programmes ended in 2007. This scope was extended by the Ministry of Higher Education and Research (MCHER) who aspired FNR foresight to support the identification of priorities at national level that could guide the development of centres of excellence in niche areas. In total the aims of FNR foresight (FNR et al., 2007) consisted of

- identification of research domains in the public sector with short-term and/or long-term socio-economic interest for Luxembourg society;
- identification of areas on which to concentrate public investment for R&D with a view to develop real centres of excellence in Luxembourg;
- support of the formulation of new FNR programmes in terms of programme priority axes and programme objectives;
- clarification and dissemination of strategic aim of FNR programmes among stakeholders; and
- consolidation of communication networks amongst stakeholders.

The first three objectives clearly refer to the first foresight function, that of 'informing and directing policy – planning'. The two last objectives imply some relevance with the second foresight function especially in terms of aligning and mobilising actors around shared visions, and strengthening inter-actors' relations. The third foresight function is hardly represented in the FNR foresight objectives. Thus, in the first instance it was mostly knowledge and networking related impacts that could be mainly anticipated by FNR Foresight.

FNR foresight had six different FVAs (i.e. the different expert panels that were set up) that were organised per scientific area: the Physical sciences & engineering (PSE), Environmental science (ENV), Social sciences-Humanities (SS&H), Law, economy and finance (LEF), the Information and Communication Technologies (ICT) and the Biomedical/Life sciences (BLS). The FVAs came together on different occasions, i.e. during the experts' workshops which were held twice and the exploratory and young researchers' workshops which were one-off events.

The exercise had two distinct methodological phases and the final outputs were a list of research priorities that were directly implemented in the formulation of the next FNR programme for support of research activities. The main methods used in FNR foresight even with small variations across the different scientific disciplines, were stakeholder panels, brainstorming, expert panels, stakeholder consultation, stakeholders analysis, SWOT Analysis, key/critical technologies, interviews, surveys, benchmarking, voting/polling, indicators, literature review, roadmapping, bibliometrics, and patent analysis.[5]

Based on the Foresight Diamond (Popper, 2010 in Georgiou et al., 2008) most of these methods fall within the two corners of 'expertise' and 'evidence' while some (5) reach the 'interaction' corner, i.e. were more participatory in nature. The first impression from this observation is that the specific exercise was equipped better to serve the first rather than the second or third foresight functions as most of the methods were about producing anticipatory intelligence rather than bringing

[5] For a brief explanation of each method please visit http://rafaelpopper.wordpress.com/foresight-methods/last accessed 14 October 2016.

Table 1
Intended foresight impacts of FNR foresight that were achieved.

1st Foresight function: informing and directing policy-planning	
Improved knowledge base about future:	
● Better understanding of SWOT and dynamics of change	[c]
Framing knowledge into policy support:	
● Disclosure of hidden agendas and obstacles	[b]
● (Funding/investment) priority setting	[c]
● Better informed strategies and policies	[c]
Capacity building:	
● Increased experience in using foresight tools	[b]
● Strategic thinking/vision building capabilities	[b]
2nd Foresight function: Facilitating decision-making and policy implementation	
Foresight culture development:	
● Stimulation and inspiration to apply foresight	[b]
● Challenge of mindsets	[b]
Improved decision/policy-making:	
● Alignment and commitment to shared visions	[a]
Improved system actors and inter-actor relations:	
● Improved communication and collaboration	[b]
● New networks and strengthened communities	[b]
Improved policy systems:	
3rd Foresight function: Embedding more stakeholders' views in policy-making	
Strengthened role of society:	
● Orientation of innovation to societal needs	[a]

Source: compiled by the author based on interviews with FNR Foresight organisers and participants.
[a] Achieved to a low degree.
[b] Moderately achieved.
[c] Highly achieved.

different actors together to discuss about the future. In addition, mainly academics were involved in the whole processes rather than societal stakeholders.

5.1.2. Assessment of the impacts towards more participatory 'knowledge societies'

5.1.2.1. Intended impacts. Intended impacts are the impacts that are expected by the organisers and clients of the exercise based on the way it was designed and the associated mechanisms of delivery of impacts. In assessing intended impacts the interviewees were presented with a collection of possible impacts from foresight exercises based on the available literature and corresponding to the three major foresight functions identified above. Their judgements on which impacts were relevant for FNR Foresight is presented in the following table.

As Table 1 shows, the most achieved impacts were '(funding/investment) priority setting' and 'better informed strategies and policies' which directly relate to the 'informing' foresight function. After the Government's agreement on the list of national priorities, this new strategy and the foresight results were put together in a new approach: a single framework programme reflecting the strategic positioning of the FNR, with the results of the Foresight providing thematic orientation. A first call for project proposals was launched in early 2008, some two years after the initial deadline, with a budget amounting to 12% of the national public R&D budget for this sole programme. (Glod, Duprel, & Keenan, 2009)

Another important finding is that the participants could not see the 'aligning and mobilising actors around shared visions, strengthening inter-actors' relations, and nurturing a foresight culture' as the key objective of the exercise as much as the organisers did. This points to a shortage of achievements in relation to the second foresight function 'facilitating decision-making and policy implementation'.

While 'improved communication and collaboration' was chosen as both relevant and achieved, interviewees noted that it was more the 'communication' part that was improved rather than the 'collaboration'. While 'new networks and strengthened communities' was relevant it was less considered as achieved with mainly strengthened communities rather than formation of new networks. The same applied for 'alignment and commitment to shared visions' although an interviewee noted that indeed people realised they had to align themselves with the national priorities.

At the same time, 'challenge of mindsets' was not achieved even though considered as relevant by half of the organisers. Yet, interviewees did point out that people realised it was useful to question themselves. An explanation for the limited achievement of such impacts can be that "people did not see it as something they could take away with them" as an interviewee noted. The exercise did not manage to make the participants feel 'safe' enough to overcome their defensive attitudes, or to provide them with inputs and results interesting enough to challenge their mindsets, take further and exploit on their own through new networks or alignments.

It seems that the possibility that people collaborate with each other once they are brought together for a specific purpose was overestimated. This in combination with the low novelty of the results as well as the perception of the exercise primarily as an FNR internal project hindered impacts related to formation of new networks, or alignments. In parallel, the time

limitations and the workshop organisations as one-off events deterred systematic interactions and collective learning and knowledge creation.

On the positive side, 'stimulation and inspiration to apply foresight' was seen as both relevant and achieved even though mainly for FNR than the participating organisations. It is believed that the exercise managed to make concepts like 'prospective studies', and 'foresight' acceptable among the Luxemburgish administration and society. As an interviewee characteristically noted 'foresight entered in people's minds as useful to apply in defining what the country might need and that people were now in a position to talk'. In addition, there is a strong commitment from policy makers to build a more forward-looking and strategic culture across the public research base and an acknowledgement that the FNR Foresight has contributed to this goal in no small part. (Glod et al., 2009)

In summary, out of the four main elements of the second foresight function (collective learning and knowledge creation, aligning and mobilising actors, strengthening inter-actors' relations, and nurturing a foresight culture) it seems that the two last ones were translated into achieved impacts but even those to a moderate extent. Thus, indeed FNR foresight seems to fall short in fulfilling the second foresight function 'facilitating decision-making and policy implementation'.

In relation to the third foresight function "embedding more stakeholders' views in policy-making" participants appreciated their embedding to policy-making more than this was intended by the organisers. This points to a possible unintended impact. The participants appreciated that such an exercise took place for the first time in Luxemburg and that they took part in it. They further mentioned that it was a valuable starting point without which the next steps in applying such inclusive and participatory techniques in policy – making could not be taken. The outcome might have been the same without the foresight exercise but also without people's consent. This first try was important to raise awareness and also start building the infrastructure needed for the following exercises. Indeed as Glod et al. (2009) report about the FNR Foresight impacts, the exercise, through the wide dissemination and awareness raising activities, familiarised the wider public with the stakeholders as well as with the role of science in a modern society.

5.1.2.2. Unintended impacts. In the interviews the specific questions referring to possible unintended impact were mainly addressed to the participants out of which around 50% provided comments. The rest stated that they did not consider any unintended impacts to have been significantly achieved considering mainly the perceived objectives of the exercise and the actual impacts as they evidenced them. Interviewees were presented with a list of possible unintended impacts in the three areas above from which they were asked to identify any relevant and possible impacts in the case of FNR foresight (Table 2).

5.1.2.2.1. Knowledge – related impacts. As expected, given that FNR foresight mostly related with the first foresight function most of the participants' comments about possible unintended impacts referred to the knowledge-related domain. In detail, it was skills enhancement and capacity building to exchange and create knowledge at individual and organisational levels that was mainly appreciated as a side effect.

Interviewees also agreed that foresight can enhance knowledge exchange and creation among individuals because it can raise their interest and build trust among each other through its processes. An interview noted that the reverse statement was also true while pointing out that both were verified to some extent in the case of FNR foresight. Several interviewees noted that such processes should be continued at regular intervals not to miss the opportunity to build on an already positive start.

5.1.2.2.2. Networking – related impacts. The unintended impacts in relation to networking that the interviewees recognised were 'increased collaboration beyond the foresight exercise' and 'expansion/diversification of social capital of individuals or organisations'. The latter was indeed verified as several interviewees noted that they did not know all participants beforehand and were happy to make new acquaintances. As for the 'increased collaboration beyond the foresight exercise' it was natural for interviewees to aspire improved collaboration at least under the new FNR programme which endorsed the new commonly agreed priorities. In addition, it was noted that networking impacts were still 'work in progress'.

Table 2
Achieved unintended impacts for FNR foresight.

Achieved unintended impact types	
Related to knowledge creation, absorption & diffusion	
1. Skills enhancement (multidisciplinary work, social skills, strategic thinking, etc)	[b]
2. Capacity building to exchange and create knowledge at individual/org. levels	[b]
Related to networking and collective learning	
1. Increased collaboration beyond the foresight exercise	[b]
2. Expansion/diversification of social capital of individuals or organisations	[b]
Related to enhancing public engagement in decision −making	
1. More informed and concerned people	[b]

Source: compiled by the author based on interviews with FNR Foresight organisers and participants.
[a]Achieved to a low degree.
[c]Highly achieved.
[b] Moderately achieved.

5.1.2.2.3. Public participation – related impacts. Unintended impacts in relation to public participation were not expected as the third foresight function was hardly represented in the exercise's rationale and key objectives. Surprisingly however, the participants that were interviewed stated that they had become more informed and concerned and acknowledged that the more people are well-informed and concerned, the more they can be actively engaged to the benefit of foresight exercises and visa versa.

Their apprehension of risks and uncertainties from scientific developments was also improved. An interviewee also added that the role of science was now more acknowledged in general given that after the exercise journals dedicated special sections about scientific issues to raise public awareness of science. In terms of the most important factors affecting public participation the governance and institutional conditions were noted and the degree to which they promote wider public engagement.

5.2. The case of eFORESEE Malta

eFORESEE Malta was part of the eFORESEE project, a *trans*-national foresight project co-funded by the European Commission, aimed at helping three small accession countries, Cyprus, Estonia and Malta, to meet a number of common challenges through the use of foresight. The three partner countries shared a common challenge of introducing foresight into a transition economy context and into a policy system which was undergoing fast pressures of change in the critical pre-accession phase.

5.2.1. Foresight rationale, key objectives and functions

eFORESEE Malta was carried out in 2001–2003. Malta was facing a number of challenges at the time. National efforts were focused on the "accession challenge", a major drive requiring the deployment of strategies, measures and considerably more resources than available to meet the political, legislative, consultative needs related to taking on board the legislation and regulations that constitute the EU Acquis. It was clear that joined-up policies and cross-sectoral strategies were needed particularly to enable effective use of the structural funds for research, technological development and innovation priorities (Pace and Cassingena Harper, 2004).

In this context, foresight was identified as a viable approach to reversing deeply entrenched habits and cultures for formulating and implementing policy and renewing networks and partnerships. The need emerged to activate and support fast policy learning and unlearning processes, and to bridge the divide between policy-makers and society by engaging able new actors and moving towards more consensus-oriented dialogue (Cassingena Harper & Georghiou, 2005). Accordingly, the rationale for the Foresight exercise was (Pace & Cassingena Harper, 2004):

- To address the challenges faced by policy makers implementing foresight activities for smaller economies and regions.
- To examine the potential role of foresight in dealing with the structural changes to the economy that accompany the accession process as well as the integration of the accession states into the European Research Area.
- To explore the decision-making processes involved in setting up foresight activities as well as the challenge of managing and implementing specific foresight actions.

Clearly-defined objectives were set[6]:

- To elaborate a vision for Malta as an advanced knowledge economy in 2020 whose main resource is its ability to develop human capital in new economy skills all round the world from a Mediterranean base;
- Guide the decision-making of MCST's input into the National Development Plan (2003–2006);
- Mobilise public-private sector partnerships to take action on business opportunities;
- Revitalise old networks and stimulate the formation of new networks (cross-disciplinary and cross-sectoral, involving new kinds of players such as management and HR consultants, researchers and educators);
- To explore Foresight methodology and approaches and record the process.

It is evident that eFORESEE Malta referred to all the three main foresight functions identified by the impact assessment framework. The 'informing and directing policy' function is reflected in the two first main objectives. The 'facilitating decision-making and policy implementation' is addressed by the third and fifth objective. The third and fourth objectives also address the function relating to 'embedding more stakeholders' views in policy making.

eFORESEE Malta consisted of three pilot themes: Exploring Knowledge Futures in ICT and Education" (ICT pilot); "Realising a Thriving Maltese Biotechnology Industry by 2015" (Biotech pilot); and "Towards Enhancing Marine Sector's Contribution to the Maltese Economy in 2020" (Marine pilot). In general, for each pilot, one panel (in the case of Biotech Pilot two panels) was set up which included a wide diversity of stakeholders. Thus, three FVAs can be defined for eFORESEE Malta corresponding to each of the three pilot themes. The members of the FVAs were brought together on a number of occasions, i.e. training events, panel meetings and the scenario workshops.

[6] Forlearn On line Guide, http://forlearn.jrc.ec.europa.eu/guide/7_cases/EforeseeMalta.htm#Objectives accessed 14 October 2016.

Regarding the main methods used based on the Foresight Diamond (Popper, 2010) most of the methods fall within the corners of 'expertise', 'evidence' and 'interaction'. No specific methods were applied drawing on creativity. Promoting creativity was mainly addressed through the invitation of non-experts to participate especially in the ICT FVA.

5.2.2. Assessment of the impacts towards more participatory 'knowledge societies'

5.2.2.1. Intended impacts. In relation to 'informing and directing policy' (first foresight function), the first pilot produced indeed high quality scenarios and action plans. Based on these, the Ministry for Investments, Industry and Information Technology, worked with MCST for the formulation of the research and innovation elements of the RDTI Strategy. The recommended action lines were also taken into consideration by MCST in the formulation of the National Development Plan 2007–2013 (Cassingena Harper & Georghiou, 2005).

The results of eFORESEE Malta pilot on ICT were also fed in the Research and Development section of the Single Programming Document, while a specific reference to eFORESEE and its results was also made in the National Budget Speech 2002 and the updated National RTDI Strategy presented to Cabinet by MCST in 2003 and subsequently approved. The specific pilot also generated a follow-up SME mobility action offering foresight training for programme managers, new graduates and the under-employed funded through the Structural Funds Programme (European Social Fund) (ibid.).

In relation to 'facilitating policy implementation', the second foresight function, this was mainly achieved by bringing into the discussions the main high level visionaries and strategic planners in Malta (from Malta Enterprise, the National

Table 3
Most relevant intended foresight impacts to eFORESEE Malta.

1st Foresight function: informing and directing policy-planning	Relevance to eFORESEE Malta
Improved knowledge base about future:	
• Better understanding of SWOT and dynamics of change	b
• Increased risk awareness – effective contingency planning	a
Framing knowledge into policy support:	
• Disclosure of hidden agendas and obstacles	b
• Agenda setting	b
• Better informed strategies and policies	c
Other: Raising STI in national agenda	b
Capacity building:	
• Increased experience in using foresight tools	b
• Use of foresight within organisations/other settings	b
• Strategic thinking/vision building capabilities	b
• Capacity to engage in foresight	b
Other: Policy learning	b
2nd Foresight function: Facilitating decision-making and policy implementation	Relevance to eFORESEE Malta
Collective learning and knowledge creation:	
• Development of shared visions	c
Foresight culture development:	
• Stimulation and inspiration to apply foresight	c
• Increased involvement in foresight activities	b
• Thinking out of the box	b
• Challenge of mindsets	b
Other: Awareness of need for consensus building approaches	
Improved decision/policy-making:	
• Better management of pressures and challenges	a
• Enabling buy-in to decision-making processes	b
• Disclosure of conflicts/self-reflecting among actors	a
• Alignment and commitment to shared visions	c
Improved system actors and inter-actor relations:	
• Trust building between system actors	b
• Improved communication and collaboration	b
• Links/networks across diverse groups	b
• Empowerment of (new) actors	b
• New networks and strengthened communities	b
• Enhanced reputation and image	a
3rd Foresight function: Embedding more stakeholders' views in policy-making	Relevance to eFORESEE Malta
Strengthened role of society:	
• Orientation of innovation to societal needs	b
Improved governance:	
• Transparent, open, participatory, legitimate governance	b
• Broadened participation – democratic renewal	b

Source: compiled by the author based on interviews with eFORESEE organisers and participants.
[a] Less relevant.
[b] Relevant.
[c] Very relevant.

Development Plan and the e-Malta Commission) and also by developing strategic alliances and partnerships. For example, strategic networking was accomplished with the Office of the Prime Minister's Regional Policy Directorate, the Ministry for Information Technology and Investments and Malta Enterprise.

According to the interviewees, the Maltese exercise inspired the launch of several initiatives, the most significant being the Competitive Malta Foundation, a corporate-led set up to promote competitiveness based on research and innovation. The Competitive Malta Foundation followed up the foresight exercise by launching a national vision-setting exercise commissioned by the Prime Minister involving also the Opposition. (ibid.)

Bringing new actors into policy-making was the objective related to the third function. The ICT pilot did succeed in bringing together a multidisciplinary panel, including domain experts mainly from university, consultancies and private sector training institutes, together with theatre specialists, students and policy makers (Table 3).

5.2.2.2. Unintended impacts. eFORESEE Malta was also rich in generating a range of unforeseen impacts.

5.2.2.2.1. Knowledge – related impacts. The use of foresight approaches in other settings has been quite extensive. The recently launched National Information Technology Strategy has been developed through an open on-line consultation process and is being implemented on the basis of public-private sector collaboration. Similar approaches were adopted in other sectors than research and innovation, such as for the formulation of the Malta Structure Plan which focuses on long-term policies for sustainable land use and development. Also, the foresight philosophy is reflected in Malta's contribution on future generations and the common heritage principle within the Convention on the Law of the Sea and Climate Change (Cassingena Harper & Georghiou, 2005).

Furthermore, foresight approaches were more broadly incorporated into MCST's work and activities, particularly in relation to the European Commission Framework Programme Six as there was extensive follow-up to eFORESEE with a range of European and International projects. Investments in foresight training also proved critical not only for ensuring the quality of the foresight process and results, but also for the embedding of a wider and deeper foresight culture. As noted above certain spill-overs emerged like the inclusion of foresight in the research and teaching agenda of the University of Malta (Cassingena Harper & Georghiou, 2005).

5.2.2.2.2. Networking and collective learning related impacts. The involvement of experts from other fields and non-experts was probably one of the key untargeted impacts of the first pilot. At the same time, the foresight exercise was important in strengthening MCST's links with a range of players in the innovation system. Another major unintended impact was policy learning. Increased awareness was generated of the need for consensus-building approaches in long-term vision-setting exercises and the profile of research and innovation was raised on the national agenda (Pace & Cassingena Harper, 2004).

5.2.2.2.3. Public participation – related impacts. Foresight was also applied to make more transparent policy processes and structures. It helped bring to the fore key challenges and hidden obstacles to the introduction of more informed, transparent, open participatory processes to governance. At the same time, public awareness increased about science, technology and innovation policy concerns among local players (ibid.).

Based on the above evidence for eFORESEE Malta the relevance of the unintended impacts suggested by the impact assessment framework is shown in Table 4 below.

6. Discussion and conclusions

Foresight exercises are 'by default' devised to promote democratic processes and public engagement in designing for the future. Irrespective of their particular rationales and objectives they can and do contribute to the development of more participatory societies. This is mainly done through the processes applied which may fit the purpose of the specific objectives but are also characterised by inclusiveness, openness, transparency, public engagement, and multi-stakeholder approaches. These processes lead to certain impacts in relation to making people more concerned and informed about scientific issues and thus more empowered in participating in relevant policy-making processes. These impacts are highly valued by participants even though achievement of the intended impacts may have been less satisfactory.

The official aims of FNR Foresight had little to do with increased public participation or engagement in policy-making processes and deliberations. Overall, FNR Foresight did achieve its official objectives although facing several difficulties that limited the impacts it could have achieved had these difficulties been foreseen and overcome.

Nevertheless, certain impacts were appreciated by the participants even though not initially aimed at. One of them was the opportunity to strengthen relations and collaborations across individuals and organisations once they managed to get out of their defensive mode and engage in constructive dialogues. Participants saw strengthened communities as an impact and understood that they had to align themselves with the national priorities.

They also saw foresight as a useful tool in defining national priorities as well as a trust building tool and a platform for giving people a voice. They appreciated their embedding to policy-making more than this was intended by the organisers. As characteristically noted national priorities could have been defined in a number of different ways than applying foresight; the outcome might have been the same but without people's consent.

Table 4
Achieved unintended impacts based on the framework's typology.

Achieved unintended impact types	Relevance to eFORESEE Malta
Related to knowledge creation, absorption & diffusion	
1. Increased use of the new knowledge in other settings (beyond the foresight exercise)	[c]
2. Increased availability of knowledge	[c]
3. Skills enhancement (multidisciplinary work, social skills, strategic thinking, etc)	[b]
4. Capacity building to exchange and create knowledge at individual/org. levels	
Related to networking and collective learning	
1. Increased collaboration beyond the foresight exercise	[c]
2. Creation of sustainable networks for knowledge sharing and creation	[c]
3. Expansion/diversification of social capital of individuals or organisations	[b]
4. Birth of knowledge spill-overs or foresight spin-offs	[c]
5. Increased creativity and innovation generation in individuals/networks	[a]
Related to enhancing public engagement in decision −making	
1. Enhanced apprehension of risks and uncertainties	[a]
2. More informed and concerned people	[b]
3. Increased public trust;	
4. Enhanced public participation processes/institutionalisation of participatory process	
5. Actors' collaboration/alignment to tackle risks	

Source: compiled by the author based on interviews with eFORESEE organisers and participants.
[a] Less relevant.
[b] Relevant.
[c] Very relevant.

Another important, unintended impact, was equipping people with the necessary knowledge and skills to participate in strategic discussions about science and technology. FNR Foresight brought scientific and technological issues closer to society. Apprehension of risks and uncertainties from scientific developments improved and people were now more informed and concerned. In this regard people are now better equipped to engage in similar discussions in the future.

Overall, FNR Foresight unintentionally managed to open the ground for participatory approaches in strategic deliberations in Luxemburg, while also facilitating people's engagement through increasing their knowledge and skills.

eFORESEE Malta had certain orientations among its main objectives that directly link to facilitating increased public participation. This was the objective of bringing new actors into policy-making which was achieved to a great extent as discussed in the previous sections.

eFORESEE used a step-wise approach in actively engaging the key actors but also connecting with other actors in the national innovation system. This resulted to a number of unintended impacts including for example raising the profile of research and innovation in the national agenda, increasing public awareness about science, technology and innovation policy concerns among local players and increasing awareness of the need for consensus-building approaches in long-term vision-setting exercises. This resulted in certain foresight spin offs in diverse areas such as theatre or education which helped spread the foresight philosophy in the Maltese society even more.

Thus, eFORESEE, as in the case of FNR Foresight but to a larger extent, contributed to making people realise the importance of science, technology and innovation, and also helped them acquire the necessary skills in getting engaged in strategic discussions and policy-making. At the same time eFORESEE led the way towards improved democratic processes, i.e. more informed, transparent, and open participatory governance. eFORESEE managed to achieve significant, yet unintended, impacts in relation to increased public engagement. The intended and unintended impacts achieved clearly influenced the political culture showing clear sings of behavioural additionality.

However, even if foresight is "by default" designed to lead to increased public participation and improved democratic processes, it stills remains an issue whether this leads to more effective policy-making. In a policy roundtable organised under the VERA project[7] European policy-makers were brought together to discuss the usefulness of foresight in forming research and innovation policies in dealing with the so-called 'Grand Challenges'. Although the benefit of foresight to revive democratic practices in policy-making through inclusion and transparency was recognised, the point was made that for certain challenges immediate action is necessary through for example legislation than democratic discussions reflecting that 'we should stop talking and start acting'.

Taking this point further, this might indicate that participatory foresight may be more appropriate when dealing with novel issues/areas that entail high uncertainly and thus public concern, or with known issues/areas where the public view might have changed and/or was never considered. A scale of public participation may be appropriate depending on the focus and objectives of the foresight exercise and the 'closeness' and relevance of the subject area to society's interests, although this is rather difficult given the high inter-dependencies and blurring boundaries between societal and technological elements in research and innovation.

[7] www.era-visions.eu last accessed 14 October 2016.

Yet, in designing effective policies for dealing with 'Grand Challenges' it is important to link-up to on-going, bottom-up transition processes and to mobilise new actors into new types of collaboration that reach out to ambitious future goals beyond today's comfort zones while high quality leadership remains crucial in these endeavours.[8]

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