

D2.3 Defining policy scenarios

Project acronym:	SENSE4US
Project full title:	Data Insights for Policy Makers and Citizens
Grant agreement no.:	611242
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Document Reference:	D2.3
Dissemination Level:	PU
Version:	Final
Date:	06/10/14



History

<i>Version</i>	<i>Date</i>	<i>Modification reason</i>	<i>Modified by</i>
0.1	14/07/14	Initial draft	Matt Korris Ruth Fox Rasa Uzdavinyte Timo Wandhöfer
0.4	2/9/14	Quality check	Steve Taylor Paul Walland
0.14	24/9/14	Final reviewed deliverable	Aron Larsson Virginia Gibbons Ruth Fox



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List of abbreviations

Abbreviation	Explanation
APPGs	All Party Parliamentary Groups
ALBs	Arm's length bodies
CCS	Carbon capture and storage
CDU	Christian Democratic Union party (Germany)
CO ₂	Carbon dioxide
CSU	Christian Social Union party (Germany)
DECC	Department for Energy and Climate Change (UK)
DEFRA	Department for Energy, Food and Rural Affairs (UK)
DGs	Directorates General of the European Parliament
DOW	Description of work
EC	European Commission
EEG	Renewable Energy Act (Germany)
EP	European Parliament
ETS	Emissions Trading Scheme
FDP	Free Democratic party (Germany)
GDP	Gross domestic product
GHG	Greenhouse gases
ICT	Information and Communication Technology
IPCC	Intergovernmental Panel on Climate Change
LCA	Life cycle assessment
MPs/MEPs	Members of Parliament/Members of European Parliament
NAEI	National Atmospheric Emissions Inventory
NGO	Non-governmental organisation
NMW	National Minimum Wage
ONS	Office for National Statistics (UK)
RDF	Resource description framework
R&D	Research and development
SPD	Social Democrat party (Germany)
URL	Web link (Uniform Resource Locator)

Executive summary

The purpose of this deliverable is to define scenarios and policy issues at each of the different policy-making levels, which can be used to drive and evaluate the ICT research carried out by the consortium.

The creation of policy scenarios will help to 'drive' the research in a number of ways:

- The policy scenarios will allow the different research components to be tested and improved using real world data;
- The policy scenarios will allow the tool kit to come alive for end users – they will be able to see the potential for their work much more clearly when the tool is a working prototype and is populated with data;
- It will allow the project to focus on end users within a specific policy area, meaning that engagement can be more targeted, more in-depth, and carried out with users who have a greater stake in working with Sense4us.

The policy scenarios will draw on intelligence gathered in the initial end user engagement phase (detailed in D2.1) and a set of agreed criteria will be used to assess the suitability of different scenarios, both from the perspective of the project and from the perspective of the end users we hope to engage.

The criteria used to assess the suitability of the policy scenarios are as follows:

- Relevance of the policy;
- Willingness of end users to engage;
- Longevity of the policy;
- Availability of policy alternatives;
- Availability of relevant data;
- Easily defined parameters.

Eight policy scenarios were judged against the criteria and we have identified the following scenarios as being most appropriate to drive and evaluate the research at each of the different levels:

- EU level – implementing renewables targets for 2030 across the EU;
- National level (UK) – national plans for 2030 renewables targets in the UK;
- State/local level (Germany) – implementation of renewable energy in North Rhine-Westphalia.

Partners at each level have provided comprehensive contextual information about: the policy scenarios; how they meet the criteria defined by the consortium; potential end users to engage with; and a plan for moving forward with the engagement.



1 Introduction

1.1 The Project: Sense4us

Sense4us is a three-year project that was launched in October 2013 and co-funded under the Seventh Framework Programme (FP7-ICT-2013-10). It aims to assist policy-makers by giving them tools to access a wide array of current data, take into account the views of citizens on policy issues in real time and help them to better understand the implications of proposed policies. Policy-makers at the EU, national (UK) and local (Germany) levels will be engaged in the development of Sense4us to ensure the toolkit has the widest possible application.

Making and implementing policy at any level of government is fraught with difficulty. The impact of decisions are not always obvious at the time the policy is formulated or enacted, and any short-comings in the policy often become known only when it is too late to change it. This is due to a lack of high quality information but also the difficulty of finding and aggregating the right data out of the sea of information which characterizes our modern world. Having formulated a policy it is then difficult to make useful predictions about its likely impact and effectiveness. In addition, policy specialists may lack the resources and the methodology to be able to access the most current data and may not be in a position to take into account the views of citizens on policy issues expressed in real time through social network discussions.

As policy specialists currently have to rely on readily available public information sources based on historic rather than current data, and on consultation with a select group of experts, Sense4us is creating a toolkit which will support them in gathering and understanding information and modelling policies. The Sense4us package will be based on cutting-edge research.

The project's tools will enable:

- the extraction of information from big data and open data sources;
- the automatic annotation and linkage of homogeneous data;
- the lexical analysis of sources;
- the creation of policy models combining quantitative open data sources with qualitative data from social media;
- the likely impacts of a policy to be simulated, via understandable visualizations;
- the tracking of discussion dynamics in social media; and
- the gathering of information more quickly and efficiently, using an accessible and intuitive interface.

Through close interaction with policy-makers around Europe and through cutting edge research, the Sense4us project supports more effective policy development.

The ultimate objective of the Sense4us project is to advance the fields of policy modelling and simulation, data analytics and social network discussion dynamics, providing economic and social benefits to policy-makers at all governmental levels across Europe.

1.2 WP2: End user requirements

In order to gather requirements, WP2 set out to research the policy-making process and to understand the challenges that policy-makers face when developing policy in the different policy-making environments. WP2 therefore dedicated its efforts to engaging directly with policy-makers from different levels of government: at the EU level, at national level in the UK, and at local level in Germany.



D2.3 Defining policy scenarios

A discussion of the requirements for the Sense4us tool that were gathered from policy-makers in PM 1-9 can be found in D2.1 – Assessment of end user requirements.

As described in the DoW, all end user partners are responsible for individual tasks at their level (European, regional, national):

- Gov2U has a European focus engaging with: MEPs and their staff in the European Parliament, European Parliament officials from selected committees and European Commission officials (Policy Officers and Heads of Unit);
- Hansard Society has a UK based national focus engaging with: MPs, Peers, civil servants, committee clerks, and parliamentary officials;
- GESIS has a regional to local focus engaging with: MPs from the German Bundestag, the State Parliament of North Rhine-Westphalia and the City state of Berlin.

WP2 has a total of 6 objectives to be completed by the end of the project (please see DoW SENSE4US, p. 9). However, the scope of this deliverable is to present the progress achieved towards the following objective:

- Define scenarios and policy issues that can be used to drive and evaluate the ICT research carried out by the consortium.

Although this deliverable focuses on an objective that is unique to it, D2.3 does draw on the findings of the end user engagement process detailed in D2.1. The most pertinent findings from D2.1 are referenced in this document in section 3.1 to aid an understanding of why certain policy scenarios were selected.

2 Purpose and scope of the deliverable

The aim of this deliverable is to define scenarios and policy issues at each of the different policy-making levels, which can be used to drive and evaluate the ICT research carried out by the consortium.

2.1 What do we mean by policy scenarios?

In this deliverable a policy scenario is an example of a real world policy or issue that the Sense4us tool could be used to enhance or improve. It is a worked example that can give the tool substance, ensure that the work we are doing is not purely theoretical and that it is tested and validated in a real life policy environment.

These scenarios could be proposed policies that the Sense4us tool can use as a test to evaluate the research in real time. However, due to the often unstructured, ad hoc and closed nature of policy-making, as well as time scales that can be inconsistent, subject to highly changeable political factors or otherwise incompatible with those of the Sense4us project, using the tool in a live policy environment may not be possible.

Policy scenarios could also therefore be challenging issues that policy-makers are likely to create policies for in the future; Sense4us could play a part in this pre-selection/research process. An example of this might be fracking, which is an issue in the UK and across the European Union about which there is much debate, limited research and, at the time of writing, few agreed policy options.

Choosing the right policy scenario/s will be important to enable the tool to be tested rigorously as well as illustrating its potential to end users. This is why we have employed the criteria shown in section 2.4 to assess the appropriateness of the policy scenarios chosen to test the Sense4us tool.

2.2 What will the policy scenarios help us to achieve?

The creation of policy scenarios will help to 'drive' the research in a number of ways:

- They will allow the different research components to be tested and improved using real world data in a real world policy-making context;
- They will allow the tool to come alive for end users – they will be able to see the potential for their work much more clearly when the tool is a working prototype and is populated with data;
- They will allow the project to seek end users who specialise and are interested in a particular subject area, meaning engagement can be more targeted, and although it may be less broad, it will be more in depth. End users that work with the issue we are using as a test case will have a greater stake in engaging with the project, advising on refinements to the requirements, helping design the simulation, populating the tool with the highest quality data and eventually evaluating Sense4us.

This will allow the tool to be tested with concrete, real-world and useful test cases that appeal to the end users and help with the development and evaluation of Sense4us.

2.3 How do we decide which scenarios to choose?

In order to make the scenarios beneficial to the project they need to work for three different stakeholder groups.

Firstly, the scenarios need to work for the Sense4us consortium: allowing the working prototype to be presented to external audiences, ensuring the three different research components can be populated with real data, tested and evaluated, and that engagement with end users can be targeted effectively.

Secondly, the scenarios also need to be achievable in the time frame available. To ensure this is the case it may be necessary to choose a policy scenario that can work across the different levels of policy-making rather than choosing three unrelated scenarios. In addition, having one policy scenario that could demonstrate the work of all the research partners simultaneously, would help to test the integration of the tool, show how the different components can work to complement each other and add up to more than the sum of their parts.

Thirdly, the scenarios needs to be a challenging macro policy area where policy-makers find it problematic to gather evidence and public opinion and to understand the long-term impact of their policies. The policy area should be one that has been referenced in surveys, interviews and focus groups as being challenging for policy-makers – to ensure that Sense4us is ambitious in its objectives and that end users will find the test case we choose helpful for their work.

Fulfilling these three key conditions is a pre-requisite for any policy scenarios we choose. However, there are more specific, practical criteria against which the scenarios need to be evaluated to ensure their feasibility. The criteria detailed in section 2.4 will give an indication of how well a policy scenario will work and how successful it could be in a number of important areas for the development of the tool.

2.4 Criteria for assessing policy scenarios

The consortium jointly decided the criteria for assessing which policy scenarios would be the most effective test of the tool and would ensure the policy scenarios were achievable, as well as showcasing the different research elements sufficiently to end users.

2.4.1 Relevance of the policy scenario

How relevant is this policy to end users, the public and also to political and research institutions across Europe? Choosing a policy that is relevant to end users and the citizens they serve should help us to sustain engagement over time.

The presence of the following indicators would suggest that a policy scenario is relevant:

- Policy papers (recently passed or proposed), manifesto commitments, debates in Parliament, speeches to the media;
- Public interest in the issue – opinion polls, e-petitions, campaign group engagement, social media discussion;
- Media interest and the length of time this is sustained.

2.4.2 Willingness of end users to engage

This element will be strongly related to a number of other criteria, such as relevance and longevity, but it will also be important to choose a policy area that is large enough to have plenty of end users that we can speak to about the specific policy scenario and also the tool. Choosing a broad policy area means that there are likely to be a range of end users we could



speak to within the executive and the legislature, such as committee staff who will give us a useful additional perspective.

Whether the policy is a priority issue will also play a role in whether there are end users willing to engage. It needs to be relevant, but controversial policy areas should be avoided because there is a risk that policy-makers will be unwilling to discuss them with us. In such circumstances it is highly unlikely that they will be willing to use their policy as a test case for our tool, in case it leads to a result that they consider politically unpalatable or contrary to current policy.

Mapping end users involved with a proposed policy scenario should help us ascertain how many people we can engage with, what their roles are and what kind of help they can offer us. Choosing a scenario where policy-makers have already carried out policy-modelling, used open data or tracked social media attitudes may encourage them to engage as they are likely to be less resistant to using these new methods for policy-making. Where there is a project that has been successfully completed, such as the Department for Energy and Climate Change's 2050 carbon simulator¹, using a policy scenario that draws on elements of that project might encourage the policy makers involved to engage, as it would add value to something they have already done. Building on this previous work may be seen as beneficial for the Department, especially in public relations terms.

However, if we were to ask end users in a range of different departments if they would engage with us in the event that we selected their departmental policy issue as a test-case, then the likely response will, in most cases, be positive. But we know from experience that while policy or decision-makers might, in principle, be keen to engage, in practice whether they do so will be dependent on a number of factors beyond our (and often their) control, not least their own time and workload pressures, as well as the political context at that given moment. Therefore widely contacting end users in a number of different departments with an open invitation to engage with particular policy scenarios is likely to be time-consuming and ultimately, from a cost-benefit perspective, largely unproductive. A more targeted approach, which selects the users that are most likely to be willing to engage with the project, is a more effective strategy.

2.4.3 Longevity of the issue or policy

It is crucial for the Sense4us project that the policy area has sufficient longevity that it is not resolved prior to the completion of the project's work. Encouragingly, many of the macro issues mentioned by end users in the engagement for D2.1 are by their nature long-term challenges that will not be fixed by a single policy in a single political institution, which make them good candidates for consideration as a policy scenario.

It is also important that the policy or issue has longevity in the media and in political circles to ensure there is a continuing impetus to tackle it. Is it an issue where there is a significant political will to address it, and are the politicians and policy-makers willing to expend political capital in doing so? To what extent is interest in the policy dependent on the tide of events?

Ensuring that the policy issue/s chosen are driven by multiple factors, should help to ensure that a policy or issue remains relevant for the duration of the project. Possible drivers of an issue could be:

- Events - e.g. flooding in the UK in early 2014;
- The media – linked to events and public opinion;

¹ Details about the calculator: <https://www.gov.uk/2050-pathways-analysis> [accessed 07/08/2014]



- Public opinion – this is especially relevant because the importance of an issue to the public is likely to be reflected in social media discussion;
- NGOs/campaign groups – although campaigns on a certain issue may be short-lived;
- Politicians – both the government and opposition.

2.4.4 Availability of policy alternatives

Having a number of policy options is important for the decision support framework as it attempts to aid the generation of different policy alternatives and filter out a set of alternative options if the theoretically possible alternatives are overwhelming for a user. However, finding alternatives to an already proposed policy can be difficult – alternative policy proposals that have been rejected are rarely made public if there has been no formal public consultation, and although opposition parties may be against a policy they are unlikely to have drawn up detailed alternative policy plans. If the level of engagement is good with end users, they may permit us access to some discarded policy options, but despite the open policy-making agenda, this is likely to be a step too far for most of them. Alternatively, it's possible that there was only cursory discussion of policy alternatives if the government was particularly set on the direction they wanted a policy to take.

Other sources of policy alternatives may need to be drawn on and could include:

- Manifestos from opposition political parties;
- Policy comparisons from other countries;
- Think tank or campaign group recommendations and policy suggestions;
- Academic research and suggested alternative courses of action;
- Committee recommendations.

2.4.5 Availability of relevant data

The availability of data is obviously a crucial criteria for choosing a policy test case as the tool kit depends on data from a range of sources to provide the best results. There will be many types of data that are necessary to feed the tool – ideally our test case would have some data in all the categories below rather than lots of data in just one or two of them:

- Open data – policy areas that rely on sensitive data (such as defence) are likely to be unhelpful as the amount of open data will be very limited;
- Social media data – non-controversial policies may be discussed less regularly but a long-term issue such as climate change may have constant levels of discussion that peak depending on events or the behaviour of political actors or campaign groups;
- Academic research – this may be limited by the arrangements that govern access to journals;
- Policy-makers' own data – there is a slim chance that policy-makers may give us access to non-open data in order to test the tool with our chosen policy test case. However, it is likely to depend on whether the data is controversial or considered personally sensitive;



- Policy documents – these could include draft policies but also internal or external research used to develop policy as well as past policy documents that have been discarded or enacted.

It would seem likely that policy areas of long-term concern such as carbon emissions, would have plenty of data. Policy areas that are cross-cutting and where there are international indicators or targets would also be likely to have plenty of different types of data, and statistics from both official and unofficial sources.

2.4.6 Easily defined parameters

Ideally, the policy area or issue would have clear boundaries that would shape what parameters need to be considered by the Sense4us tools. However, given the nature of the long-term macro policy challenges this project seeks to address, this is unlikely to be the case. Nevertheless, it would be desirable to choose a policy area for which a robust process can be utilized to determine what parameters are relevant for inclusion, identifying and separating out core factors within the policy area from more peripheral concerns. For example, within the policy area of fracking, the impact on the economy of the local/national/EU area may be a core factor for consideration, but secondary linked factors such as impact on transport congestion may not be of central importance for the initial testing of the tools. The Sense4us tools will be designed in such a way that once the core factors are addressed, additional elements can be added to see if and how they affect the outputs.

2.5 Challenges/risks when choosing policy scenarios

The choice of policy scenario carries a number of risk factors. These are identified below alongside explanations of how we propose to deal with them if they do arise.

2.5.1 Elections

EU elections in 2014 and the UK general election in 2015 means there will be a churn in end users, potentially breaking relationships that were built at the beginning of the project and disrupting user testing. In the UK, during the period from September 2014-May 2015 the attention of politicians will be focused on campaigning rather than policy. In addition, following changes to the electoral timetable, the 2015 election will usher in the longest period that the UK has seen without a Parliament since 1924; it will dissolve on 30 March and is unlikely to reconvene for approximately 51 days. This may also affect our engagement with non-elected parliamentary officials as well as elected politicians.

The process of government formation (and therefore the development of new policy) is likely to also take longer if there is another hung parliament, as there was following the 2010 election. In Parliament, select committees are unlikely to be fully operational until September/October 2015 and the officials responsible for these committees are likely to have changed. However, some officials in Parliament, such as library staff, will be unaffected by the election, and there are relatively few end users responsible for select committees, so re-establishing contact should not be too problematic.

This may mean that focusing on end users whose roles are not dependent on elections (civil servants and parliamentary officials), looking at past policy options, post-legislative scrutiny or a long-term policy test case that is less party political and therefore likely to still be on the post-election agenda, may work better in the UK setting.



The elections to the European Parliament in May, 2014 have certainly resulted in significant disruption to end user engagement. The new members of the Parliament are selected and their cabinets formed on a political basis; even though the new European Parliament met over the summer and started the new 2014 term, the change in personnel is evident.² This brings a significant shift in the end user scene as far as MEPs and their assistants are concerned. However, the staff of the standing committees remain the same, as these positions are of an administrative type (civil servants mostly). This guarantees policy continuity and that current policies are communicated to the new members of the Parliament – both, in terms of content and procedures.

In Germany a key stakeholder group are the MPs and the MPs' staff. The focus is on the State Parliament of North Rhine-Westphalia. The last state election took place in 2012 so as long as an unscheduled election doesn't take place in the state Parliament, the next regular election will take place eight months after the conclusion of the Sense4us project. If some policy-makers begin the election period early there could be a time conflict in relation to their participation in the pilots and evaluation process. In addition, GESIS plans to engage German Bundestag members. The next regular election will take place in 2017. If any pilots are scheduled with members of the German Bundestag, the evaluation would need to be finished before the start of the election period. If alternative decision-makers are scheduled for the pilots (e.g. state ministries, state or city parliaments, public authorities, cities), their availability will be clarified beforehand.

2.5.2 Lack of openness within the policy process

Although there are ambitions for the policy process to become more open, this new approach is not yet fully embedded across government. This means that there are issues with access to parts of the policy process: data that was used to make policy is not always available outside of the civil service and there is a lack of consultation around many policies where the tool could be used and policy scenarios developed.

Choosing a more open department that is used to gathering feedback from external stakeholders or experts, could help to reduce the risk of the policy scenario being ineffective or unattractive to end users. Likewise, choosing a policy area where data is more likely to be open (where the departmental data is not personal data for example) should help the chances of our policy test case having enough data to showcase and evaluate the research components.

2.5.3 Test cases less useful than first thought/lack of engagement

It is possible that the test case(s) we choose may not be as helpful for driving engagement and evaluation of the tool as first thought. We may have picked an issue area that is too broad or too narrow, too controversial for policy-makers to engage with or one that is not sufficiently relevant. This would inevitably lead to a lack of engagement from end users.

To tackle this we will ensure that we engage end users early on, once a policy scenario has been chosen, to allow us to be flexible and refine the scenario or move to another test case if the initial case is not providing enough engagement. Once we have decided on a policy we will carry out end user mapping to identify contacts whose work is specifically related to this test case (this has been carried out in this deliverable for each of the policy-making levels – see section 4).

² See: http://www.europarl.it/resource/static/files/failai_internetui/new-ep-2014-2019-reelected-and-new-meps.pdf [accessed 3/9/2014]



2.5.4 Data quality/credibility

Ensuring that the quality of input data is high will always be a challenge. However, there may be situations where the quality of a key dataset is called into question. To combat this risk, it is likely that an assessment of the quality of datasets will be needed before they are used, particularly in the simulation tool. Quality factors that could be part of an assessment are:

- Is the data peer reviewed?
- Is the dataset an official statistic?
- What methodology has been used to collect the data and how robust is it?
- How is the organization that produced the data funded?
- Are they associated with a particular political party or ideology?

To assess the quality of social media data we will consider the source from which the information is collected. Social media platforms, such as Twitter, provide a flag for verified accounts, which establishes the authenticity of the identities of key individuals and brands on Twitter. For non-verified accounts, the authenticity of users can be established by assessing whether the social media profile is linked to an official website and other metrics around frequency of use and number of followers. The authenticity of social media accounts and the weighting given to them will be considered in the algorithms and tools developed by WP5. Specification of social media data quality assessment measures will be reported in D5.2.

To assess the provenance of linked open data we will use the VoID descriptor. VoID is a vocabulary used to express metadata about RDF datasets. It acts as a bridge between data publishers and the users of RDF data. Generally metadata encoded in a VoID descriptor helps the user to decide whether the dataset is appropriate for their purpose. Generally, the metadata information available through a VoID descriptor include: name of the dataset; textual description of the dataset; entity responsible for the creation of dataset; resource from which the dataset is derived; date of creation of the dataset; date on which the dataset was changed etc. More detailed information about assessing the provenance of linked open data will be reported in D4.1.

With regard to the simulation tool, in order for a simulation model to be widely credible the sources for the model structure and for the quantitative aspects of the model, such as change transfer coefficients and time lags, must be transparent. This means that links to relevant information sources are made clear with time stamps so that the model structure and quantitative aspects can be verified. In order to make the simulation as transparent as possible, users of Sense4us will select the datasets that they want to include in the simulation. These may be official statistics, impact reports or data from academics or NGOs, but it may also be data that has been presented to the user through the search functions of the tool kit. The provenance and credibility of this data will be assessed as explained in the paragraphs above and the user will make the final quality control judgement about which datasets are the most relevant, credible or reliable.

2.5.5 Showcasing all the research work of Sense4us

Another risk is that one policy scenario may not be capable of showcasing all the research work of Sense4us equally. Some scenarios may be better suited to testing and displaying the work of certain elements of the tool.

Although this should be borne in mind when policy scenarios are being selected it may be necessary to cast the policy scenario more broadly than first imagined to allow all research components to be tested. The reason for this is that the time for policy-makers to utilize the data searching and modelling elements of the Sense4us tools to best effect is in the early



stage of policy formulation, when a range of options are under consideration and before a defined course of action has been set. During this period, social media analysis of the tool can be done on the generic discussion around an issue but may not be able to address the specifics, because until the policy has begun to be developed and defined the public debate may not be present. Wider discussion in the media and civil society is likely to be related to the legislative milestones in the various institutions, of which civil society groups will be aware and may seek to mobilize their supporters to influence. However, it can be difficult to predict the level of public engagement with certain policies. Levels of engagement with specific policies or elements of policies may also differ between countries.

In order to address this particular concern, it may be necessary to take a more generic approach to conversation on social media, e.g. analysing discussions and behaviour around an issue in general, rather than a specific policy that seeks to address this issue.

3 Identifying policy test cases

Selecting policy scenarios is an important decision for the consortium to get right – it will affect what we do for the course of the project and will have an impact on the end users engaged with throughout the project. As the policy scenarios affect the work of all partners it seemed appropriate that this was a joint decision made with input from the whole consortium.

The process for deciding on policy scenarios was as set out below:

- A set of criteria were selected after discussions amongst the consortium, to enable different scenarios to be objectively judged as to how well they would meet the needs of the project;
- Each partner suggested 2-3 test cases that they thought would best showcase their work and allow it to be tested and evaluated;
- These test cases were evaluated against the different criteria;
- The consortium made a decision about which policy scenarios would be most effective in driving the research, testing and evaluating the tool and engaging end users with the project across the three policy-making levels.

Initially it was thought that the policy test cases would be used as case studies for non-working demonstrators to give end users more of a flavour of what the tool would look like, but this was eventually abandoned as a strategy for three reasons.

1. The meetings that took place with end users were based around the scoping of the initial requirements. It was important not to prejudice the views of end users by showing them our ideas before we'd heard from them.
2. Most of the interview situations were informal discussions loosely based around a set of personalized questions that drew on themes that would help the scoping of requirements for the tool. In this kind of environment it was felt that PowerPoint presentations or complicated diagrams would be a distraction and were likely to use up precious time in explanation when we could be finding out what the end users policy-making problems were and how Sense4us might help address them.
3. It was decided that instead of aiming for non-working demonstrators at month 9 we should put our efforts into a partially working prototype at month 12. This was a strategy suggested by one of the end users – a senior figure responsible for open policy- making within the UK government – who recommended that a 'quick and dirty prototype' released as early as possible would be preferable to a more 'finished' tool that took longer to create.

It was decided to focus on one broad policy topic that covered all three end user levels (EU, national and local). This was for a number of reasons:

- Demonstrations could be created that showed the entire toolkit working on aspects of one coherent scenario, to tell the story of the project's work via the different components working together.
- Selecting an overview scenario enabled us to begin collection of data in and around that scenario, so we had a large and varied body of data to use as test data and demonstration material.

- Some of the research components require configuration or customisation depending on the domain they are working in, so knowing the broad scenario enabled the research partners to develop the tools and customisations necessary.

In order to choose the most useful policy scenarios for the end users as well as for the project, we needed to understand what the big issues were for policy-makers. Which topics do they find it hardest to understand the policy consequences of? Are there known gaps in data or are some policy areas suffering from information overload? In which areas do policy-makers need the most support?

The survey, interviews and focus groups carried out in PM 1-9 helped us to understand what the most pressing issues might be for end users, and therefore which issues might best lend themselves to being policy scenarios.

3.1 End user engagement – relevant findings

In the surveys, interviews and focus groups carried out between PM 1-9, we asked end users which issue areas were particularly problematic to understand the consequences of before policies were enacted. This was asked in order to inform the project about the most appropriate policy scenarios to pursue – in order to provide a useful tool to end users we needed to make sure we were tackling a big issue of real importance and interest that was especially challenging to end users.

In the survey that was sent out to end users at the EU and national (UK) levels, the following question was asked:

In which policy areas (yours or others) do you feel it is most difficult to predict outcomes of a given policy, before that policy is implemented?

This question enabled a comparison to be made across different levels³, about which policy areas were the most challenging to model. Areas that were mentioned in relation to this question are clearly good candidates for policy scenarios to be based on.

In addition, other insights about the most problematic policy areas were gleaned from the interviews and focus groups. The results of this investigation are detailed below and each policy-making level is discussed. For further information on the end user engagement process and results please see D2.1.

3.1.1 European level

At the European level the survey and the interviews conducted with end users gave a good “measurement of temperature” in terms of the policy fields which are deemed most problematic; whether it is initial legislative drafting stage, that includes information search, or whether it is consideration of the solution to the political issue, trying to oversee the consequences of the policy proposed.

The survey was completed by policy-makers representing a wide range of policy areas, minimizing the risk that they would give similar answers on the basis of similar backgrounds. However, despite their different roles and the different policy areas in which they work, the tendencies were quite clear: nearly half of the respondents indicated environment (47%), as a problematic field to foresee the impact of policy prior to it being enacted. The joint second

³ The question was not asked in the survey at the local (Germany) level. For the reasons behind this decision please see section 3.1.3.



D2.3 Defining policy scenarios

choices were economy and humanitarian aid (both 29%), and education and ICT were joint third (both 24%) in the top five choices of the interviewees (See Figure 1 below).

Across the policies the majority of interviewed officials and politicians named *environment* as being especially problematic in terms of expectations matching up to the outcomes of the policy once implemented. The European policy-makers that were interviewed also mentioned *economy* and *education*, but fewer respondents named *ICT (Information technologies)* or *humanitarian aid*.

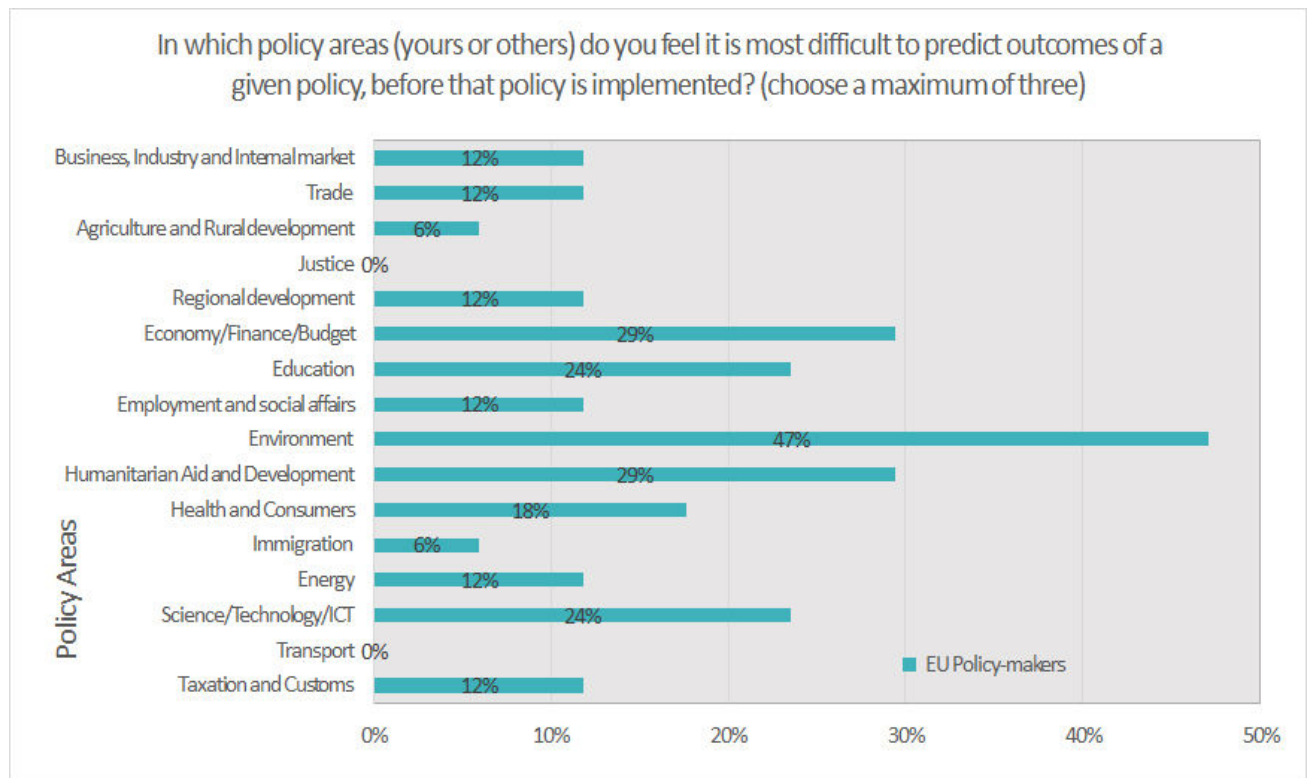


Figure 1: Most challenging policy areas to predict outcomes – EU

Additionally, the respondents across the survey and the interviews were asked:

Why are these policy areas especially difficult when predicting outcomes and what are the specific problems?

This question was asked to identify the problems that a certain policy field faces, given that the proposed development should introduce a positive change. The reasons behind the difficulties were the following:

- too many contributing factors/variables for complex issues. The trade-off in some areas and the effect of compromises between the different actors are very complex to foresee;
- the impact of policy depends on rapidly changing patterns of human behaviour;
- specific field related problems:
 - ICT: there is a lot of trial and error before technology matures which makes predictability very difficult;
 - economy: uncertainty of other actors' behaviour;
 - environment: non-predictable climate change ;
- time perspective needed: one can only predict the outcome based on various models of past data;



D2.3 Defining policy scenarios

- political implementation of policy analysis: unpredictable and subjective social values and biases may influence the behaviour of policy-makers and the reasoning behind the legislative proposals. Some political issues have too many interested parties involved, so the surrounding circumstances become politically sensitive and therefore harder to influence;
- Some policies are made for very dynamic areas, where traditional econometric models do not apply.

These challenges mentioned by end users were taken into consideration, when making a choice about a suitable policy scenario.

3.1.2 National level (UK)

At the national level the survey was sent out to two different groups that play a slightly different role in the policy-making process: policy-makers and decision-makers. A definition of these actors and their roles can be found in Appendix 1.

Despite their different roles, the policy areas that they thought were most challenging to understand the consequences of were not that dissimilar. *Europe* (84%), *foreign affairs* (65%), *economy/finance* (64%), *environment* (61%) and *immigration* (50%) were the top five policy areas selected by UK end users as a whole.

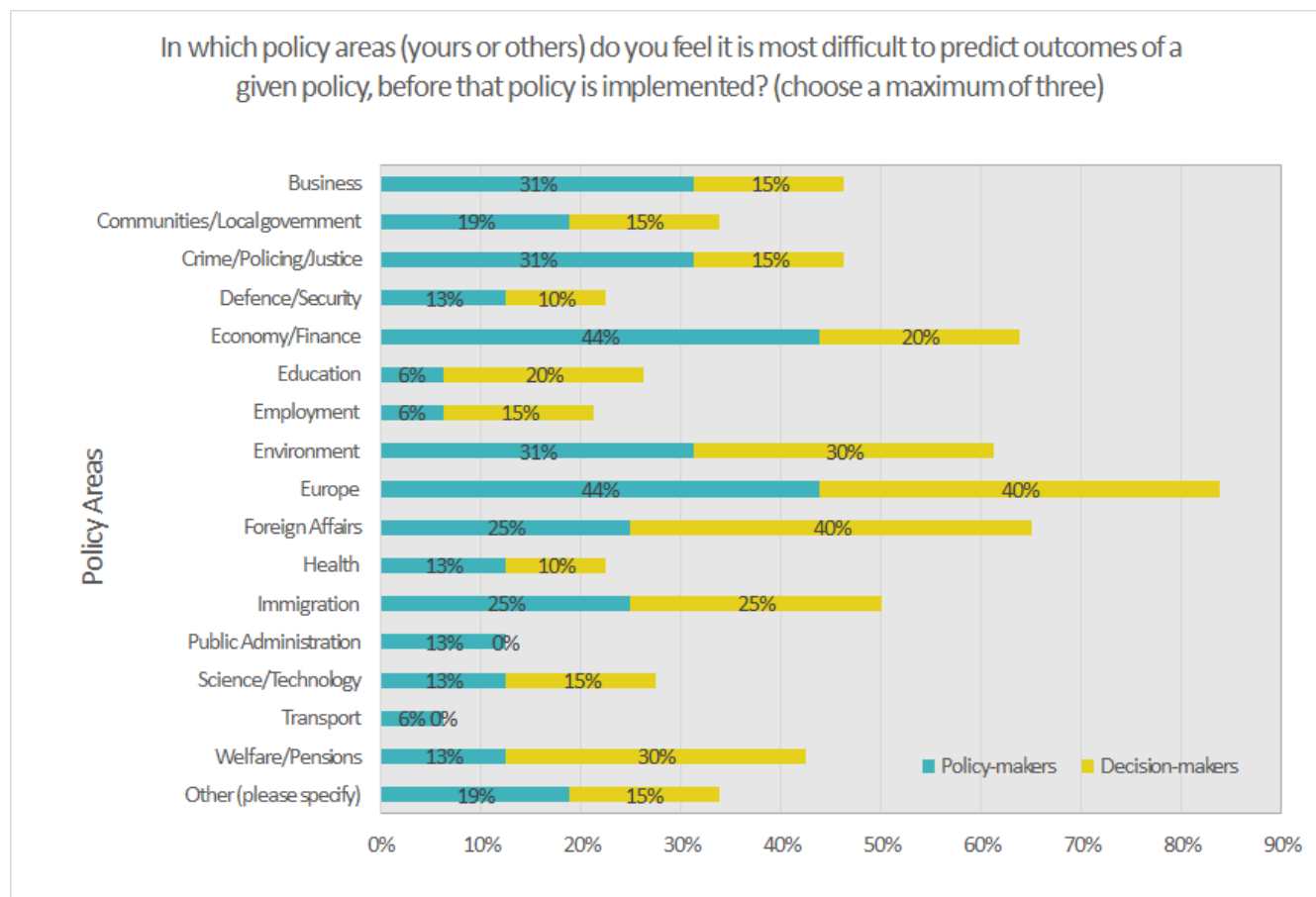


Figure 2: Most challenging policy areas to predict outcomes – UK

Marking these policy areas out as complicated issues for end users to work on gives extra weight to them being used in policy scenarios, as they are areas where Sense4us could provide additional support and highlights how the tool could be of use in a practical setting. Macro issues that cut across government department boundaries and national borders were,



not surprisingly, seen to be the most challenging issues for end users to address in the policy sphere.

In order to understand the problems with developing policy to address complex, macro issues, we also asked end users:

Why are these policy areas especially difficult when predicting outcomes and what are the specific problems?

The following extracts in bullet points are summaries of the responses to this question from the decision-maker and policy-maker surveys. For the direct responses to this question please see Appendix IV in D2.1 – Assessment of end user requirements.

- too many factors outside government control, a complex environment and relationships;
- relatively little data at macro level;
- not enough piloting or consultation to help understand future impact;
- the same policy being applied differently across the UK – can't be consistent in comparisons;
- impacts often too long- term;
- many 'unknowns' and lack of quantitative research.

Additional responses from the interviews included:

- the political context and consequences of a policy – is this policy likely to be supported by the grassroots of the political party in government? Do the aims of this policy clash with another policy that has recently been launched?
- accounting for factors outside the immediate scope of the policy or initiative that may have an impact, now or in the future;
- predictions may be based on poor quality or incomplete data, especially considering the lack of systematic evaluation and impact assessments carried out by government;
- the hypotheticals, assumptions and margins of error need to be clearly explained for prediction to be useful.

Although some of the problems mentioned are unlikely to be solved by a digital tool, as they are structural or process related, Sense4us could certainly be of assistance in discovering a wider pool of data from other countries or from subject areas that might have related data but be seen as outside the scope of the original policy by end users.

3.1.2.1 Findings from the interviews and focus groups

As with the survey results, end users that were interviewed or took part in focus groups particularly highlighted the cross-cutting, macro issues as being the most challenging when developing policy. However, the difficulties with these issues were not always rooted in the complexity of the policy issues themselves, but also in factors such as internal departmental politics and administration, as well as the wider political context that affected how such issues were handled. Given the scale and complexity of modern government, in practice it is often hard for individual departments to work across administrative boundaries, react quickly to changes in the policy environment, or deal with mistakes when they occur.

One interviewee explained that there was a difference between policy areas that were large and complex e.g. the economy/environment and those that lack a sound evidence base or



where different evidence bases are used for political reasons e.g. the economic case for Scottish independence. The Sense4us tools are better able to address the first example of complex policy-making (as the second case is a largely political rather than evidence-based decision), so these large complex issues would be more useful as policy scenarios.

Likewise the economy was an issue that was mentioned by another interviewee as being particularly complex – as a researcher that provides briefings for Members of the House of Lords, he suggested that the most often requested information was about economics and foreign affairs. However, some caution needs to be exercised here for Peers will inevitably request information about the areas of policy on which they are most focused for reasons of personal interest, topicality or to support their legislative or committee scrutiny responsibilities. The number of briefings requested does not necessarily correlate with the perceived complexity of an issue.

Social welfare and benefits policy was also mentioned as a challenging area that would benefit from modelling, due specifically to the number of variables involved and the long-term nature of the effects.

It was suggested that some policy areas were more challenging because of the culture of the department that manages them rather than the intrinsic nature of the policy. For example, one end user involved in scrutinizing government policy, suggested that in some policy areas there is currently very little policy impact analysis carried out. One department where she suggested this is the case is education, where a recent decision to make changes to the school exam syllabuses were, in her opinion, made for political reasons rather than based on robust research evidence. Although this suggests that some policy areas may benefit from a greater use of evidence and simulation, it may also be harder to get buy-in from civil servants making decisions about these policies if they are highly political and there is a limited culture of analysis and evaluation. This insight would suggest that in the UK, education policy might be an area for Sense4us to avoid using as a policy test case as sustained engagement from end users may well be difficult to achieve.

Similarly to the above example, one interviewee suggested that certain departments may be more willing to test the prototype if they are already using large amounts of data. One that is more delivery focused, such as the Department for Transport, is an example of a government department that may well be more comfortable with big data than others, as it is already using modelling to understand the impact of policy decisions⁴.

Another interviewee suggested that security was an issue about which it was particularly difficult to find information. However, this is likely to be for reasons of national security and not something that will change or that end users in charge of security policy are likely to want discuss with the project.

Although a number of different challenging policy issues were highlighted by end users, the population that was engaged with did not represent all policy areas and it is likely that end users understand the deficiencies and challenges in their policy areas better than those they do not work on. For this reason it would be difficult to justify choosing a policy area based solely on the feedback we received from end users. However, those that were highlighted as challenging issues that are difficult to predict outcomes for, are certainly issues that the project should consider choosing as policy scenarios.

⁴ For details of current Department for Transport modelling projects see: <https://www.gov.uk/government/collections/transport-appraisal-and-modelling-tools> [accessed 06/08/2014]



3.1.3 National, state and local level (Germany)

GESIS has a focus on decision-makers from the national to local level in Germany (see D2.1, section 5.1).

Potential end users for Sense4Us are MPs (German Bundestag, state parliaments and city parliaments), who are supported by their staff. These are roles like Büroleiter/-in (Office Manager), Referenten/-in (Abstractor), wissenschaftliche/r Mitarbeiter/-in (Scientific Associate) and nicht wissenschaftliche/r Mitarbeiter/-in (Non-scientific Associate). Further potential end users are the important divisions of the state government – the ministries and state chancelleries. The chancelleries belonging to the city-states (Bremen, Hamburg and Berlin) are called senate chancellery. The federal state Baden-Württemberg calls this institution the Ministry of State Baden-Württemberg. Concerning the subdivisions, potential end users are drawn from the level of governmental districts.

There are different kinds of end user groups within the policy-making process with different levels of skills. One important group are the policy-makers (e.g. MPs), who make decisions. Another important group are the decision-influencers. This means, they have the potential to influence decisions, while doing the research and gathering information (e.g. Office Manager).

For the German policy-makers, the online survey was translated from English into the German language to increase the chance that they would participate. During the translation process it emerged that some words like 'policy' or 'data' have a different meaning in Germany. For instance 'policy' is nearly boundless within the field of policy-making. Its meaning is very broad – it can be just talking about an issue or it can mean to finalize a concrete policy draft. Therefore 'politische Willensbildung' has been used for the German online survey alternatively. This means 'the forming of the political will' and covers nearly the same range that is aligned with the word 'policy' in the UK. The second important term is 'data'. In Germany it has a very technical meaning. Therefore we decided to use the phrase 'Informationen im Internet' instead. This means information from the Internet in general rather than concrete data, which could be limited to the information that is stored within databases.

Because of these different meanings we needed to reorganize the online survey. Some questions have been restructured and the order of some questions was also changed. Instead of sixteen questions (EU, UK), the German Bundestags' participants got an online survey with thirteen and the Berlin City Parliament participants got a survey with fourteen questions. Two questions were skipped, because they were considered too time consuming for the German target group (see Deliverable D2.1, Appendix V). One of these questions was: "In which policy areas (yours or others) do you feel it is most difficult to predict outcomes of a given policy, before that policy is implemented? (choose a maximum of three)". In contrast to the previous sections describing the EU and national level, this section does not provide a chart regarding this question and focuses on the results in general.

Information sources

Within the online survey circulated in the Berlin City Parliament GESIS asked for concrete databases that are used during the legislative process (see D2.1, section 5.6.7). One MP's suggestion led us to the website hosted by the Statistical Office for Berlin-Brandenburg. The website provides basic statistical information on Berlin and Brandenburg.⁵ For nationwide regional data the website recommends: The Regional Database Germany

⁵ See: <https://www.statistik-berlin-brandenburg.de/english/english.asp> [accessed 1/9/2014]

(“Regionaldatenbank Deutschland”)⁶. The website provides detailed statistical data for various official statistics in the form of standard tables and is hosted by the Office for Information and Technic for North Rhine-Westphalia (IT.NRW)⁷. IT.NRW is the statistical office for North Rhine-Westphalia and operates as IT-provider for the regional government authority North Rhine-Westphalia. IT.NRW is an expert source for regional data. In this context GESIS started a dialogue with IT.NRW to get support on the content and technical interfaces of the databases. In the future GESIS will engage IT.NRW in the project; having a strategic partner within this field will help us to strengthen the pilot scenarios.

Policy areas

Within the policy areas explored in the survey, no one favourite emerged among decision-makers. For the Bundestag results, the strongest responses were given on the topics *economy/finance* and *Europe* with five votes in total (see D2.1, section 5.6.2). A definitive policy area on which to focus did not emerge from this process.

However, one important topic area in Germany is renewable energy. In principle the strategy of increasing renewable energy, as an alternative to nuclear power, is desired at least by those citizens who are afraid of nuclear technology. But the change is very complicated and produces lots of additional costs, which are partly paid for by German citizens (see the Renewable Energy Act (abbreviated in Germany to EEG))⁸. This is a source of regular public debate in Germany. The fact that each power station is located somewhere in Germany makes it a local affair and often affects people who are living close to a particular station. For instance the German state North Rhine-Westphalia produces the most electricity in Germany and will be affected if the German EEG is modified. Hence the MPs of the State Parliament of North Rhine-Westphalia do have a strong interest in this topic (e.g. the motion 16/6191⁹).

End user engagement

The combination of the valuable information sources and the relevance of the nuclear power policy area favours the State Parliament North Rhine-Westphalia as a partner for engaging in the planned pilots.

3.1.4 End user engagement – summary

The results of the end user engagement, which are laid out in far greater detail in Deliverable 2.1, suggest that, regardless of the policy-making level, similar issues are of interest to most of the end users and they face similar problems. Although there was some variety in the issues that respondents at different levels thought were the most problematic to predict outcomes for, there were many that were commonly seen as difficult.

The issues highlighted as problematic were most often macro issues that affected most if not all citizens, were issues that cut across national or state borders, and were long-term changes with many facets and implications. Issues that appeared as high priorities across the levels

⁶ See:

<https://www.regionalstatistik.de/genesis/online/data.jsessionid=2ADDACF7DCFA327DD8259CCAD46443D0?operation=sprachwechsel&option=en> [accessed 1/9/2014]

⁷ See: <https://www.it.nrw.de/> [accessed 1/9/2014]

⁸ See: http://en.wikipedia.org/wiki/German_Renewable_Energy_Act [accessed 1/9/2014]

⁹ See motion Drucksache 16/6191:

<http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/MMD16-6191.pdf> [accessed 1/9/2014]



were: *economy/finance, foreign affairs/humanitarian aid, the environment and Europe*. This suggests that there is no one policy issue which we must address to satisfy the end users, but that any policy scenario we choose must be a complex, long-term and cross cutting policy area which can help policy-makers truly understand the implications of their policy decisions on an important, wide-reaching and complicated area of policy.

3.2 Policy scenarios considered (and rejected) by the consortium

In this section we detail our evaluation of some of the policy scenarios that were not selected as final use cases. The purpose of this is to show the pros and cons of a range of policy scenarios in relation to the criteria that have already been set out. Each partner submitted test cases that they felt would effectively showcase the tool, drive the research and allow evaluation to be carried out. The scenarios were evaluated against the criteria in section 2.4.

3.2.1 Policy scenario UK – National Minimum Wage increased above inflation

The National Minimum Wage (NMW) is the minimum pay per hour that almost all workers are entitled to by law. It doesn't matter how small an employer is, they still have to pay the minimum wage. The level that the minimum wage is set at varies according to the age of the employee.

The National Minimum Wage was in the headlines in January 2014 in the UK because the Chancellor of the Exchequer George Osborne suggested that it should increase above inflation (to a level that it would have reached had the NMW increased at the same rate as inflation) from £6.31 to £7 per hour, an 11 per cent increase. The National Minimum Wage is recommended by the Low Pay Commission, which reports each year on the level they believe the NMW should be set at.

The announcement was seen as a political move by the Chancellor to take control of the 'cost of living' argument that the Labour party has been successfully challenging the government on for the past six months. It also allows the Conservative Party to be seen as a party that has changed (it opposed the introduction of a NMW in the 1990s) and is trying to share the burden of the recession across all levels of society.

Evaluation criteria	Assessment
Relevance of the policy scenario	The level of the NMW is relevant to many citizens, particularly those that would benefit from an above inflation increase. However, media interest has not been sustained since the announcement was made early in 2014 by the Chancellor of the Exchequer. This is partly because a 3% increase was approved by the government in March 2014 and because the Low Pay Commission is primarily responsible for recommending the level of the NMW. Although pay levels are an economic issue (which end users thought was particularly challenging) this policy is not sufficiently broad or ambitious enough in its scope to thoroughly test the tool.
Willingness of end users to engage	The end users ultimately responsible for suggesting the level at which the NMW is set at are the Low Pay Commission, which consists of nine commissioners, supported by an eight person secretariat. Although this is a policy that could have a big impact on citizens and on businesses there are likely to be insufficient end users (commissioners) for the purposes of testing the tool. It would be a high-risk strategy to choose a policy that is primarily the responsibility of such a small group. If they were unwilling to engage then the test case could not proceed. Additionally, given that the Low Pay Commission's recommendations have never been rejected, it is



	unlikely that any potential end users outside the Commission will be willing to test the tool using a policy for which they do not have primary responsibility.
Longevity of the issue or policy	The issue of low pay is a long-standing structural economic problem that is unlikely to be solved any time soon. As the Chancellor has indicated that he supports an above inflation increase, it is possible that Ministers might choose to overrule the Low Pay Commission. However, if such a decision were to be taken, resulting in the introduction of a quite large increase in the NMW this is most likely to occur just before the 2015 general election for the purpose of political advantage. If a large increase were to happen at this point the need for the Sense4us tool to simulate impact or find further evidence would be unnecessary.
Availability of policy alternatives	This policy does have many policy alternatives because the NMW level could be set at varying amounts and the impact assessed accordingly. For example, there are a range of non-statutory versions of the minimum wage – e.g. the higher level Living Wage – as well as regional versions set to reflect the varying economic conditions and labour markets that exist in different parts of the country. There are also other options for tackling low pay, e.g. in work benefits such as tax credits or reducing the use of zero-hours contracts.
Availability of relevant data	Although there was initially lots of discussion about the minimum wage on social media, UK based discussion has tailed off, and discussion about this particular policy (i.e. an increase in the national minimum wage of 11%) has been replaced by generic discussion about the minimum wage. Most of the tweets around previously used hashtags about the NMW are now from the US, suggesting that discussion about this issue in the UK is in decline.
Easily defined parameters	The policy is quite self-contained in that it's easy to define the scope of the policy decision – what level should the minimum wage be set at? The key question for this policy is whether the scope is broad enough to make it a sufficiently challenging test case.

Table 1: National Minimum Wage scenario

Summary: Although this policy test case does have a direct impact on citizens, the small number of decision-makers responsible for the policy, the possibility that it may be implemented before the Sense4us project ends, and the concerns about its limited scope, mean that this scenario is one that has been rejected for the UK level.

3.2.2 Policy scenario UK – Flood Management and Reduction

Floods have become more common in the UK over recent years with the government estimating that nearly one in six properties, potentially five million in total, are at risk of flooding in England. Winter storms in 2013-14 were of exceptional duration, and led to the wettest calendar year in the UK since records began. Heavy rains combined with strong winds and high waves led to widespread flooding and coastal damage, causing significant disruption to individuals, businesses and infrastructure.

The government came under intense pressure in the winter of 2013/2014, to act to prevent future floods, to increase spending on flood defences (amidst widespread political debate about whether public spending in this area had been cut) and to limit the damage that was being caused to property and infrastructure. There was intense debate in the media about which flood management and defence mechanisms were the most effective and what should have been done to prevent the situation happening in the first place.



Evaluation criteria	Assessment
Relevance of the policy scenario	<p>This is likely to be relevant to the increasing number of people that have suffered from flooding in recent years or are now living in areas deemed to be at risk of flooding in the future. The problems each year tend to be quite localised: those directly affected are a relatively small proportion of the country. However, a much greater proportion of the population are affected by the knock-on effects on infrastructure. For example, last winter part of the Great Western train line at Dawlish was closed for 2 months after 100m of the sea wall collapsed and the railway line along it fell into the sea, affecting rail travel between London and Cornwall throughout this period.</p> <p>Consequently this scenario is likely to have appeal to a broad range of end users as it cuts across departmental boundaries. There are many government departments and agencies with roles and responsibilities relevant to the mitigation of floods and related risks: e.g. the Department for Energy and Climate Change, the Department for Transport, the Met Office, the Environment Agency, and Network Rail.</p> <p>The media were very interested at the time of the flooding, especially as much of it happened at Christmas time and the government and responsible agencies did not appear well prepared. However, as the weather improved the floods ceased to be news and the media seems less interested in the long-term policy changes which are not as immediate or newsworthy.</p>
Willingness of end users to engage	<p>Although this area is likely to involve a large number of policy-makers and those with roles that focus on research, analysis, insight and foresight, it may, in practice, be too controversial for meaningful engagement. As the government was heavily criticised both for their immediate response to the floods and their policies to avoid and mitigate flooding in the future, it's unlikely they will be keen to revisit the issue and draw attention to other options and perspectives regarding how they might improve their response. Although the government will use evidence and modelling to develop policy, unlike some departments that have an in-house team to research and model outcomes, the Department for Environment, Food and Rural Affairs (DEFRA) mostly funds outside experts to carry out this work, so there may also be fewer end users to engage with than might otherwise be the case.</p>
Longevity of the issue or policy	<p>The problem of flooding is likely to continue as there are many factors that feed it including but not limited to climate change, the need for housing to be built on flood plains and changing agricultural practices. However, this is a seasonal problem very much driven by events and if there is no flooding in the near future it is likely to be a policy that will be at the back of the minds of the public, politicians and the media.</p>
Availability of policy alternatives	<p>A problem with this issue for testing the Sense4us tool at a national level is that there is a very significant local element to flooding policy as the appropriate action varies depending on the geographic nature of the area in question. At the national level, there are unlikely to be detailed policy plans (or even manifesto commitments) from the other parties beyond generic spending pledges for flood defences. However, there is likely to be a great deal of academic research to draw on and the parliamentary committee responsible for scrutinising the work of DEFRA has also recently published a report on this issue with a number of recommendations for changes to policy. But, this means they are unlikely to be interested in revisiting the</p>



	issues in the near future other than to review the progress of their own recommendations.
Availability of relevant data	The amount of social media data is likely to be a problem unless flooding happens again (which is unpredictable). However, other forms of data on this issue are likely to be relatively easy to find as a number of government agencies are responsible for monitoring factors related to flooding e.g. the Met Office, Environment Agency, in addition to the work of the large number of academics that research these issues.
Easily defined parameters	This is an issue that is likely to stretch across a number of different areas from housing and agriculture policy to climate and the environment. This makes the parameters hard to define but makes it a policy that could be a robust test for the Sense4us policy modelling tool.

Table 2: Flood management and reduction scenario

Summary: This test case has been rejected for the UK level, primarily, because of the controversial nature of the topic which is likely to negatively affect the number of end users willing to engage. Secondly, it is an issue which has significant local dimensions and one where detailed national policy is unlikely to be a suitable response to the problem. As the Hansard Society is tasked with testing the tool at a national level this policy scenario is out of scope.

3.2.3 Policy Scenario EU – Tobacco Directive: EU level or all levels

The European Parliament together with the European Council reached an agreement on the Tobacco Directive¹⁰. The amendments initiated were mainly of a preventive kind, to significantly limit the marketing of cigarettes, regulate packaging and shapes, as well as require that the warning message be over 60% of the size of the package. This, in the words of the MEPs, should prevent young people from being attracted to smoking through the marketing of tobacco products and should influence their social behaviour.¹¹ This regulation of the tobacco industry is significant, as it will minimise the effectiveness of advertising campaigns. The key elements of the legislation to be introduced are the following:

Graphic warnings

- Combined health warnings covering 65% of the front and back of packs;
- Exemptions for big boxes of cigars and cigarillos which can have smaller graphic warnings.

Flavourings

- All flavours to be banned immediately for cigarettes and roll-your-own tobacco;
- An exception was made for a ban on menthol which is to be phased in and take effect from 2020 (a result of a compromise with the European Council);
- Flavoured water pipe tobacco will not be banned but the European Commission plan to carry out a study on its use by young people.

¹⁰ See: http://ec.europa.eu/health/tobacco/docs/dir_201440_en.pdf [accessed 3/9/2014]

¹¹ See: <http://www.europarl.europa.eu/news/en/news-room/content/20140121IPR33306/html/Tobacco-Directive-Public-Health-Committee-backs-agreement-with-EU-Ministers> [accessed 3/9/2014]



Slim cigarettes

- Slim cigarettes are still allowed (in line with European Parliament and Council vote) but lipstick and perfume packs are not permitted.

Ingredients

- Additives which are carcinogenic, mutagenic or reprotoxic in unburnt form will be prohibited;
- Sugar to be specifically mentioned as being permitted in tobacco production.

Packaging

- Cigarette packs to be a cuboid shape and contain at least 20 cigarettes. Bevelled and rounded edges allowed.

Bans

- A ban on promotional discounts, coupons etc. attached to the packets;
- Governments are free to ban cross border sales.

Quality and safety standards

- A requirement that e-cigarettes and e-liquid bottles are child and tamper-proof, are protected against breakage and leakage, and have a mechanism ensuring leakage-free refilling.

Evaluation criteria	Assessment
Relevance of the policy scenario	The policy is of high social importance and is highly debatable, because it encompasses the polarised policy challenges posed by the desire to improve public health on the one hand and the development of the tobacco industry on the other. It would provide plenty of sentiment on the policy issues, however, it can be a rather dead-end discussion, as there is a pre-existing common understanding of the negative effects of smoking. Therefore, the policy focus tends to be strictly regulatory and is somewhat limited in terms of variables and predictions.
Willingness of end users to engage	Because of the ongoing controversy around smoking this policy scenario remains controversial in the public domain. These kinds of restrictions on advertising cigarettes as attractive attributes of modern social behaviour would engage a lot of end users with the discussion emanating from a social, regulatory and health perspective.
Longevity of the issue or policy	The issue of smoking is a long-term debate in modern society, and is always a target of state policies. Certainly the evolution of medical science and the increase of diseases related to smoking influences tobacco policy and it becomes increasingly restrictive. The longevity of this policy depends on the nature of public debate more than other politically related factors.
Availability of policy alternatives	It is limited to alternatives that impose more restrictions on the industry. The only alternative is what is allowed versus what is not. New products, such as e-cigarettes can slightly shape the market and the policy towards it, but it is again just another decision about what is “allowed” and to “what extent”, as the arguments against the tobacco industry constantly increase. Twelve years after the tobacco directive came into force, smoking remains the principal preventable cause of death and about 700,000 people die of it each year. Over the years, measures taken to discourage smoking have helped to reduce the proportion of EU citizens who smoke from 40% in the EU15 in 2002 to 28% in the EU 27 in 2012. There is a clear objective from the health prevention point of view to limit this industry in the future.
Availability of	Searching google and social networks produces a lot of opinions about the

relevant data	issue of smoking, as citizens' views are quite polarised, with different perspectives reflected by smokers, non-smokers and tobacco industrialists.
Easily defined parameters	The policy has clear boundaries. Public health prevention, balanced with the wishes of the tobacco industry to promote its products and make money.

Table 3: EU smoking scenario

Summary: This policy test case does have a direct impact on citizens, therefore can generate a lot of informational material. However, there is no controversial debate going on in the public domain, it is rather the extreme opinions for "no-smoking" policies and the regulatory scope allowing the tobacco industry to pursue certain product types. So, the Directive itself is yet just another decision about what is "allowed" and to "what extent", as the arguments against the tobacco industry are consistently negative. The data available concerning the smoking and the marketing of the tobacco industry leads us to reject the scenario as a Sense4us test case, as the policy has significant limitations in reality.

3.2.4 Policy scenario DE – Bridging technology: gas turbine power station, Düsseldorf

After the Fukushima nuclear power station explosion, the pressure to phase out nuclear power in Germany increased. It was agreed that gradually all nuclear power stations should be switched off. The aim is to replace this "unsafe" technology with renewable energy. To replace a single nuclear power station with a renewable energy power station, a large area is needed where the new power station can be built. This process is time-consuming and very expensive. Even if enough renewable energy stations were to exist, the electricity network is unstable due to the fact that the wind speed changes and a cloudy heaven affects the sun's rays. The implication is that the electricity demand may be out of sync with electricity supply, risking electricity shortages at times of greatest public demand.

To address this imbalance in demand, bridging technologies are needed. For instance the gas turbine power station that is currently being built in Düsseldorf will provide enough energy to power the entire city. The power station should enter service in 2016/2017. Even if this highly modern power station is really effective and reduces CO2 emissions, in contrast to fossil energy stations it uses natural gas and not renewable energy.¹²

Evaluation criteria	Assessment
Relevance of the policy scenario	<p>The issue of bridging technology (here the gas turbine station Düsseldorf) is relevant to many citizens, because the air pollution decreases in contrast to fossil energy production and the technology is more secure than nuclear energy.</p> <p>Even if the new gas turbine reaches the highest degree of effectiveness (61%), it is a relatively uncontroversial topic, with little debate on the website of the State Parliament of North Rhine-Westphalia, nor in the media or wider public domain.</p>
Willingness of end users to engage	The gas turbine power station doesn't seem particularly controversial in the public domain. This kind of bridging technology is largely accepted and "everyone knows" that it is necessary. Therefore the willingness of end users to engage is unlikely to be very high.

¹² See: <http://www.rp-online.de/nrw/staedte/duesseldorf/turbinen-fuer-das-neue-kraftwerk-lausward-aid-1.4092660> [accessed 4/9/2014]



Longevity of the issue or policy	The issue of bridging technologies (here the gas turbine power station) is an intermediate term issue. It should bridge the gaps that result in the change from nuclear power to renewable energy. If the energy transition is successful the bridging technology will possibly be replaced. If the challenges concerning renewable energy production cannot be solved sustainably (e.g. a potential blackout) bridging technologies will need to produce energy for longer than was intended. Hence bridging technologies could prove to be a source of ongoing debate in the decades ahead.
Availability of policy alternatives	There are a number of policy alternatives because the gas turbine technology is not the only bridging technology that exists. For instance fossil energy production is also an option and is more controversial. There is, for example, a strong debate about the brown coal power station in Gazweiler.
Availability of relevant data	Searching google and social networks produces results demonstrating a level of public interest but it is not very strong. As mentioned above the policy is widely accepted and therefore has support from the majority of residents. This may affect the polarity of the discussion taking place. Even the website/database of the State Parliament of North Rhine-Westphalia does not provide much information concerning gas turbine energy production.
Easily defined parameters	The policy has clear boundaries. Bridging technology means that technologies like gas turbine energy stations are currently necessary, but will be replaced in the near future (with renewable energy). Hence parameters are the cost benefit calculation. How long does it take the power station to become profitable? Does it produce any negative effects for citizens, particularly those who live close to the power station? Is the bridging technology climate friendly? Does it keep jobs? Does it increase or decrease the energy costs for local residents or all citizens in Germany?

Table 4: Bridging Technology scenario

Summary: This policy test case does have a direct impact on citizens and even more so on local residents. But the fact that there is no controversial debate going on in the public domain and that there is little data available concerning the gas turbine power station in Düsseldorf, leads us to reject the scenario as a Sense4us test case.

3.2.5 Policy scenario DE – Carbon dioxide pipeline, Dormagen

The pipeline transports carbon dioxide between Bayer AG's facilities at Krefeld-Uerdingen and Dormagen. Carbon dioxide is used to produce plastic and other chemical materials. The pipeline was finished in December 2009 but needed repair in 2010 and 2011. Since 2014 the Higher Regional Court Münster managed the negotiations for bringing the pipeline into service. However, it has now decided that the 2006 approved hydraulic line are unconstitutional. Currently there is no decision if the pipeline can be used at all and when.¹³

Evaluation criteria	Assessment
Relevance of the policy scenario	<p>The issue of Carbon dioxide pipeline in North Rhine-Westphalia is relevant to citizens, particularly those living close to the pipeline. Carbon dioxide is dangerous and this fact makes residents afraid.</p> <p>Currently there is no decision yet, if or when the pipeline will be brought into service.</p>

¹³ See: http://de.wikipedia.org/wiki/CO-Pipeline_der_Bayer_AG [accessed 4/9/2014]



Willingness of end users to engage	As the Higher Regional Court Münster has decided that the hydraulic line is unconstitutional, Bayer AG cannot bring the pipeline into service. Hence residents do not need to fear the carbon dioxide currently. However, that a sculpture was erected to embody the protests and to remind those in the area that there was opposition to the pipeline, demonstrates the strength of feeling amongst residents.
Longevity of the issue or policy	The question of transporting carbon dioxide through a pipeline can be a very long policy process to resolve. Projects like this are often accompanied by citizen protests, which can make the whole process very long and complicated and significantly delay decisions.
Availability of policy alternatives	This policy does have many policy alternatives, because the transportation of gas or liquids (e.g. oil) or similar materials is accepted as necessary within a consumer society. For instance there is a strong debate in Germany about how electricity can be transported from the wind mill parks in the northern part of the country to the southern part, where the electricity is needed. Even if electricity is different to carbon dioxide, the residents (e.g. in North Rhine-Westphalia) who are directly affected by the electricity trail are protesting.
Availability of relevant data	The fact that there exists a page on Wikipedia shows that the scenario is a big issue and produces available online data. The proposed route of the pipeline was built using data that took into account the density of population, protected landscape or land use designation which could be helpful. This data is available throughout regional databases and could be used by Sense4us.
Easily defined parameters	The policy has clear boundaries. For Bayer AG the carbon dioxide pipeline is a necessary and a worthwhile investment, because it is an effective means to link both of its facilities. However, residents are afraid of the carbon dioxide, if it is to be transported through the pipeline close to their homes.

Table 5: Carbon dioxide pipeline scenario

Summary: Since the Higher Regional Court Münster recently stopped the process for bringing the pipeline into service it is unclear how long it will take if there are changes concerning this decision: e.g. if Bayer AG is successful with a revision or a new plan to transport alternative chemical materials through the pipeline is proposed. Although the scenario has produced highly controversial opinions and debates between the chemical industry and residents/NGOs, since the judgement has been made these debates have largely ceased. This fact rejects the scenario as Sense4us test case.

4 Policy scenarios: EU, UK, Germany

4.1 Policy scenario: EU level – renewable targets 2030

4.1.1 Context

The idea of the renewables policy scenario came from the agenda of the European Parliament in the term before the elections of the new European Parliament, as the 2030 Framework for Climate and Energy Policies was one of the “hot” topics of discussion. In response to climate change and international commitments to stop changing weather patterns that damage natural ecosystems and pose substantial risks to society, there has been an on-going debate over the past year on what the EU's climate and energy targets should be for the next period until 2030. Currently the EU has binding targets in place for a 20% reduction in emissions by 2020 and targets to ensure that at least 20% of all energy is generated from renewable sources. Although there have been some revolutionary developments in renewable energy technology, which are making low-carbon energy production increasingly cost-effective, it is difficult to separate renewables from the wider view of climate change objectives, as the whole set of policy measures proposed – i.e. key targets for renewables, energy efficiency, gas emissions - are interlinked. Therefore proposing a new target for renewables must be evidenced by scientific, environmental, economic and geopolitical information and the on-going discussion around setting the new targets for 2030 should balance environmental, social and commercial interests.

4.1.1.1 Renewables 2030: topic analysis

From the decision-making point of view, or speaking in legislative terms, the *2030 framework for climate and energy policies*¹⁴ is still the European Commission's Green Paper, which means it is a non-legislative file (it does not have the same effect as a White Paper, leading to Directives or Regulations, which must be compulsorily implemented), which prepares the debate, and might later end up as a White Paper. Currently, the discussion is on-going with the European Parliament, which debated the Green Paper, proposed by the European Commission, and came up with the resolution on it, asking for further binding legislative measures. So it is good for our project to pick a topic which is currently on the agenda and to be able to present some facilitation to the policy-making, in terms of verification of proposed policy decisions. It is even more interesting for the project to take on-going political debate as a use case, as the information we provide in our Sense4us tool might have a real-time added-value to the policy-makers and the feedback from engaged policy-makers could benefit the project itself.

The main policy issues, arising from the EU Renewables 2030 targets are:

- New targets for a renewable resource share of 30% of total energy consumption suggested by the European Parliament (also, greenhouse gas emissions reduction by 40% and an energy efficiency target of 40%);
- Conflicting commercial interest in terms of fuel market competition (renewables vs. fossil fuels vs. atomic energy sector) and energy market balance as an objective (to build competitiveness and improve the business environment);
- Renewables consumption raises questions over land use and the environmental impact on the land/soil. Citizens are often critical about the use of their property/land for renewable energy production;

¹⁴ See: http://ec.europa.eu/energy/green_paper_2030_en.htm [accessed 3/9/2014]



- The environmental impact of creating a low carbon environment is mostly positive – a greener climate, less CO2 etc.

Progress on energy targets 2020

Current data indicates that the parties will successfully achieve the 2020 goals¹⁵ with some countries already having achieved these binding targets.¹⁶ The targets also had positive economic outcomes - renewable energy sources have created a job market of about one million jobs across Europe and reduced fossil fuel import needs. Between 2004 and 2011, the share of renewable energy increased by 60 % (see Figure 3 below), reaching 13% of gross final energy consumption in 2011.

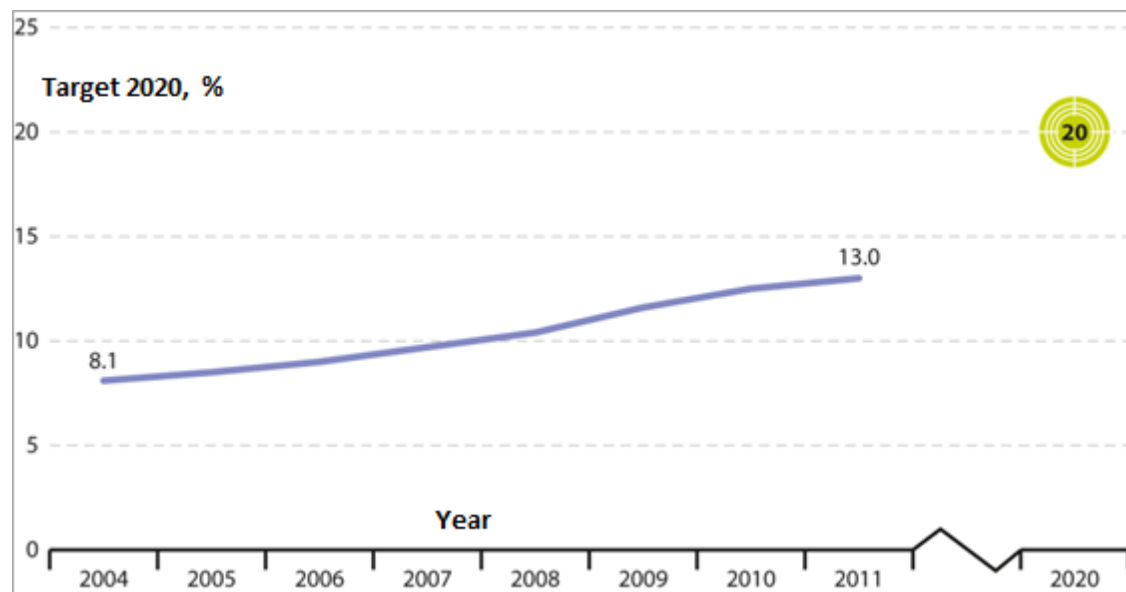


Figure 3: EU renewable energy progress on 2020 targets

Source: Eurostat

As the European Commission explains, the two main drivers of this increase were the support schemes for renewable energy technology and shrinking costs:

As a result of applied policies such as feed-in tariffs, grants, tax credits and quota systems, installed capacity for renewable electricity and heat generation as well as the use of renewable transport fuels has grown steadily over the past decade.¹⁷

¹⁵ Statistical data on the progress as well as 2020 targets themselves can be found here: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Europe_2020_indicators_-_climate_change_and_energy [accessed 3/9/2014]

¹⁶ For example, Sweden, Estonia and Bulgaria: <http://www.climatecentral.org/news/three-eu-countries-hit-2020-renewable-benchmarks-early-17167> [accessed 3/9/2014]

¹⁷ See: http://epp.eurostat.ec.europa.eu/statistics_explained/index.php?title=Sustainable_development_-_climate_change_and_energy&oldid=195634 [accessed 30/9/2014]



Therefore, climate and energy policy for Europe helps to deal with issues such as economic stagnation and competitiveness in international markets, not to mention the obvious environmental benefits such as reducing pollution.

Coherent approach on climate change and parallel measures

More renewable energy means fewer emissions across the EU, which puts pressure on the market to re-arrange itself, using more environmentally friendly resources in production and transport, therefore challenging the current business environment and the status quo. The need to move to ambitious and binding climate and energy targets for 2030 has to progress in line with scientific findings on climate change. It is estimated that in order to avoid the most severe consequences of climate change, emissions have to be reduced by 80-95 percent by 2050 and to balance the energy market and provide energy efficiency, renewables must therefore increase in use. In practice, this means learning how to live without fossil fuels, even if plentiful supplies remain. It is possible to reach these objectives with existing technologies, and is not more expensive than retrofitting out-dated infrastructure designed around fossil fuels. These findings are presented in The European Commission's study *A Roadmap for moving to a competitive low carbon economy in 2050*.¹⁸

In addition to the long-term targets framework, other measures in the energy and environment market have to be in line with meeting the current target or market demands. Recently the European Commission proposed to amend the *Renewable Energy Directive* (2009/28/EC, "RED")¹⁹, aimed at the promotion of biofuels with low or with no indirect land-use changes, and with low indirect greenhouse gas emissions ("Advanced Biofuels"). However, public consultations on the proposal demonstrate that renewable energy questions are controversial, are not clearly understood, and do not command clear public support (Public consultation: *Indirect land use change impacts of biofuels*, European Commission, 2010).²⁰ Establishing a set of measures that balance multiple interests, is therefore a long-term political challenge. Whilst some of the environmental lobby organizations persistently question biofuels in general – they call for proper calculations of the emissions from indirect land use change and question if directive targets are being met. If the methodology used to calculate environmental impact is flawed, then renewables can be more damaging than fossil fuels²¹.

Ongoing debate for 2030 and competitiveness arguments

Research by the European Commission shows that increased renewables use has led to annual savings of €10 billion in avoided imported fuel costs, highlighting how critical renewables are for maintaining the competitiveness of Europe's industry.²² Initially the

¹⁸ See: http://ec.europa.eu/energy/energy2020/roadmap/index_en.htm [accessed 3/9/2014]

¹⁹ Proposal for a Directive of The European Parliament and of The Council amending Directive 98/70/EC relating to the quality of Petrol and Diesel fuels and amending Directive 2009/28/EC on the Promotion of the Use of Energy from Renewable Sources: http://ec.europa.eu/energy/renewables/biofuels/doc/biofuels/com_2012_0595_en.pdf [accessed 3/9/2014]

²⁰ Public consultation - contributions from Citizens: http://ec.europa.eu/energy/renewables/consultations/2010_10_31_iluc_and_biofuels_en.htm [accessed 3/9/2014]

²¹ See: <http://www.foeeurope.org/biofuels-reform-ILUC-letter-250912> [accessed 3/9/2014]

²² Euractiv: http://www.euractiv.com/energy/eu-study-efficiency-renewables-e-news-532921?utm_source=EurActiv%20Newsletter&utm_campaign=8082b9282a-

Commission tabled proposals in January 2014 for a binding target of 27% of the EU's energy consumption to come from renewables by 2030, which was criticised by NGOs and the clean tech sector for lack of ambition.²³ The European Parliament suggested raising the renewable energy target to 30% in February, but as the new EU wide targets will be implemented through national targets, taking into account each country's situation, the European Council may also play a crucial role.

With its 2050 Roadmap the European Union is setting out a plan to meet the long-term target of reducing emissions by 80 to 95% by 2050 and is exploring routes towards a decarbonized energy system. All the scenarios set out by the European Commission include a growing share of renewables, described as a 'no regrets' option. The main political discussion focuses on these variables (emissions and renewables) and has to be balanced between various environmental, political, economic interests.

4.1.2 How does this policy scenario meet the evaluation criteria?

The policy scenario of EU renewables targets for 2030 is a good choice for the Sense4us tool development and testing, as it will be possible to use the data gathered in real time, engage policy-makers in the discussion, add value to an on-going debate, demonstrate policy simulation functionality, as well as gather sentiments from social media at the time of the policy discussions.

However, the sections below present a wider evaluation of each of the criteria in turn.

4.1.2.1 Relevance of the policy scenario

This is an ongoing debate, as energy remains a top political issue across Europe. The sensitivity of energy resources in practical and geopolitical terms has implications for interdependence between states and a reshaping of the global security balance, as well as the wider challenges posed by climate change in the long run. It is not just an environmental objective or a business strategy, it has a massive influence on the security issues within the EU as well as individual member states' relations with Russia, which is the top provider of energy resources to European countries and a difficult market player. Therefore, alternative energy sources to fossil fuels are a matter of debate and the key issue to be addressed in the environmental field.

A coherent approach to EU Energy market

Co-rapporteur for the Environment Committee in the European Parliament, Anne Delvaux, said in a statement:

*The price of energy seriously affects companies, industry and, more specifically, our citizens. If we want to reduce our energy imports we have to produce more in Europe, by making better and more efficient use of our resources. If we have a broad energy mix with greater energy efficiency, this is the best option to reduce greenhouse gas emissions, to encourage new technologies and innovation, create jobs, and change our economies into greener economies. This is why we need three binding objectives.*²⁴

[newsletter_energy&utm_medium=email&utm_term=0_bab5f0ea4e-8082b9282a-245524567](https://www.sense4us.eu/newsletter_energy&utm_medium=email&utm_term=0_bab5f0ea4e-8082b9282a-245524567)
[accessed 3/9/2014]

²³ The Climate Group: <http://www.theclimategroup.org/what-we-do/news-and-blogs/eu-announces-40-emission-reduction-target-and-27-share-of-renewable-energy-by-2030/> [accessed 3/9/2014]

²⁴ Ibid.

National interests vs. European goals

The targets have to be in line with the individual member states' interests and market development so they can reach the new benchmarks. This brings into play a lot of national priorities beyond pure environmental concerns.

However, renewable energy targets should not be seen as uncontroversial. Some states have questioned their benefits in meeting wider emissions reduction targets. Europe needs a common renewable energy goal that coincides with each member states' infrastructure and long-term interests. This is a challenge still to be met.²⁵

4.1.2.2 Willingness of end users to engage

Environmental issues were mentioned by the majority of end users, interviewed at the requirement gathering stage. It was the top policy area in overall survey and interview findings at the EU level, and was noted as a difficult area in which to predict policy outcomes, due to the dynamic nature of the field and the wide range of different factors involved.

In terms of engagement it needs further research and communication due to the recent elections of the European Parliament and the resulting change in MEPs and their staff, as well as the new formation of the European Commission that is currently taking place (September, 2014). However, since the policy is an on-going area of debate on the agenda, it shouldn't be difficult to engage policy-makers, working for DGs and EP committees responsible for the policy.

The policy-makers that could potentially be engaged are found in the policy units that are directly responsible for drafting legislative proposals in DG Energy in the European Commission. In addition, MEPs that are members of: the Committee on the Environment, Public Health and Food Safety; the Committee on Industry, Research and Energy; the Committee on Internal Market and Consumer Protection; the Committee on Employment and Social Affairs; and the Committee on Regional Development, within the European Parliament, may also be engaged.

4.1.2.3 Longevity of the issue or policy

The long-term aim is to meet emission reduction targets for 2050. Therefore, the debate is ongoing and has a very long-term perspective. Even though the target is set for 10 or 20 years, the possibility of following the dynamics and elaborating on previous predictions is of interest to policy-makers. Currently, it is certainly a debate of primary importance.

The 2030 debate is still at the consultation stage, which is happening through the framework of the Green Paper prepared by the European Commission. This is the first step towards binding legislation.

The timeline of the Green Paper is as follows:

GREEN PAPER 2030 framework for climate and energy policies timeline	
27-03-2013	Adoption by Commission

²⁵ See: http://www.forum-ekonomiczne.pl/8th-energy-forum/debate-renewable-energy-in-europe/?lang=en#.VBHfvvl_uSo [accessed 3/9/2014]











Decision mode	Oral procedure
Addressee	Committee of the Regions; Council; European Eco. & Soc. Committee; European Parliament
Jointly responsible	DG Energy
Documents	 COM/2013/169/FINAL  IP/2013/272/
Type of file:	Green Paper
CELEX NUMBER	 52013DC0169
27-03-2013	Transmission to Council
27-03-2013	Transmission to EP
30-01-2014	Committee of Regions opinion
Decision mode	Majority
Documents	 Opinion COR/2013/5810/  OJ C/2014/126/ 11
CELEX NUMBER	 52013IR5810
05-02-2014	EP resolution
Jointly responsible	National Parliaments
Documents	 TA/2014/94/P7
04-06-2014	EESC opinion
Decision mode	Majority
Documents	 EESC/2014/917/

Table 6: Green Paper timeline*Source: European Commission*

Therefore, the Green Paper consultation cycle is not yet finished. However, after gathering opinions from the other institutions, the European Commission will decide whether or not it believes a new policy is needed. If it does, it will publish a White Paper, explaining what it thinks this policy should be. This will contain proposed legislative measures that will become a binding legislative proposal. This can happen through the co-decision procedure, as demanded by the European Parliament. The average cycle of the legislative proposal can vary; it depends on whether the Parliament adopts it during the first reading stage (15 months) or whether it will need a second reading stage (13 months).²⁶ However, its importance was stressed in the discussions in the Parliament and the Green Paper was adopted during first reading. The European Commission expressed the real-time importance of the issue when addressing the European Parliament:

Why is it crucial that we reach agreement rapidly on a 2030 framework? For one, it is in the interests of European investors, the business community and others. They need

²⁶ The Co-Decision Procedure (Art. 251 Teu), Analysis And Statistics Of The 2004-2009 Legislature, P.6 http://ec.europa.eu/codecision/statistics/docs/report_statistics_public_draft_en.pdf [accessed 3/9/2014]

to know where we are going after 2020. They are already planning for after 2020. That is one very important reason. It will, of course, also enable the European Union to speak with one voice in the international climate negotiations...Your approval of the report is a key step in the process of reaching an inter-institutional agreement on the 2030 climate and energy policy and being able to exercise EU-leadership internationally. ²⁷

The urgency of the matter and this time perspective is a good basis for this policy scenario to be chosen for Sense4us, as there will be a lot of data and sentiment emanating from social media about it, whilst the proposed policy simulation tool can have a real-time impact and increase engagement from the end users taking part in the project.

4.1.2.4 Availability of policy alternatives

Renewable sources of energy - wind power, solar power (thermal and photovoltaic), hydro-electric power, tidal power, geothermal energy and biomass - are an essential alternative to fossil fuels. The key question remains the proportion of the energy share, how the set of measures will be balanced and how the split of various commercial and state interests will be met. Alternative energy sources, including renewables, need to be justified by scientific, environmental and economic factors, as well as public debate in contrast to the usual resources (fossil fuels). This justification is critical to raise positive support and “discounts” in other energy sectors. The bigger energy market share target for renewables, will mean changes in the electricity, heating and cooling sectors and will impact on biofuel consumption in transport and more generally.

It is increasingly evident that energy security is one of the key factors that will influence policy choices in this area. The Parliament has stressed the need to ensure the energy security of Europe and to aim for self-sufficiency. This policy is not just about consumption and the environment, it is also about wider questions of supranational balance of power and the EU’s role in the world. In light of the changing security conditions globally, alternative environmental policies which may help Europe to be more independent from its eastern energy supplier – Russia – can play a vital role.

The European Parliament has also stressed that the continuation of this policy through the adoption of binding renewable energy targets for 2030 will enable the EU to compete with China, the US, South Korea, Japan and India for technology leadership in future markets, even in times of economic constraint. The resolution insists on the need to build a coherent financial architecture for climate change. ²⁸

However, some arguments against the proposed renewables policy need to be addressed:

1. There is some criticism of EU energy policy in general and the internationally binding approach, rather than setting national targets, as the conditions and resources in the EU member states differ significantly.

EU targets to combat climate change, and lead the charge for an internationally binding deal must be applauded, but with such a divergent spectrum within their own house, reaching these targets in the future is going to become progressively harder. To have binding EU targets, you must have a coherent and long term strategy which is broadly

²⁷ See: <http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-//EP//TEXT+CRE+20140204+ITEM-018+DOC+XML+V0//EN&language=EN> [accessed 3/9/2014]

²⁸ See: <http://www.europarl.europa.eu/oeil/popups/summary.do?id=1336401&t=d&l=en> [accessed 3/9/2014]

*based along similar lines across different member states. What we currently have is a kaleidoscope of various strategies, led by national interests, in a sector which is reliant on international stability and cooperation. The 2030 framework fails in this regard.*²⁹

2. The on-going debate in some big energy countries like Germany leads to wider debates about national economic interests. Germany is very keen to develop its *Energiewende*³⁰ (radical restructuring of the energy sector from nuclear and fossil fuels to renewable energy) and meet EU 2050 targets but may reconsider its plans for expensive renewables and focus on more domestic natural gas production, because it will help the country's economy to stay more competitive.³¹
3. There is also a combined critical approach,³² concerning the whole set of measures proposed by the EU in the climate change and energy field. It is questioned whether the renewables target is superfluous, as the ETS sets enough of an obligation to reduce emissions, therefore renewables targets have little impact on CO2 emissions and may have a negative impact on the ETS – the primary policy instrument responsible for reducing emissions from heavily polluting sectors:

*A “complementary policy” under the cap, such as a renewables target, will either be irrelevant (if it is not binding) or, if it is binding, any additional emissions reductions achieved in the electricity sector under the complementary measure (the renewables program) will cause electricity generators to have additional allowances they do not need. And they will not tear up those allowances, but will sell them to other sources, such as those in other sectors. Hence, emissions in those other sectors will be greater than they otherwise would have been, completely neutralizing the emissions-reduction impact of the renewables policy.*³³

4.1.2.5 Availability of relevant data

The number of relevant online resources is considerable (see the mapping of resources in Table 7), therefore there is a lot of data in various formats, as well as public debate which can be tracked on social media. Apart from the official documents available, there are a large number of studies – from official to scientific, as well as on-going debate in the media.

Resource	Link	Assessment
Documents		
2030 framework for climate and energy policies	http://www.europarl.europa.eu/oeil/popups/ficheprocedure.do?reference=2013/2135(INI)&I=en#tab-0	Document and official procedure
EC and EP impact assessment and related studies, public consultations	http://www.europarl.europa.eu/RegData/etudes/workshop/join/2012/492461/IPOL-ITRE_AT(2012)492461_EN.pdf http://ec.europa.eu/energy/renewables/c	Publicly available analysis

²⁹ See: <http://www.europeanpublicaffairs.eu/eu-2030-objectives-emissions-vs-renewables/> [accessed 3/9/2014]

³⁰ See: <http://www.dw.de/what-exactly-is-germanys-energiewende/a-16540762> [accessed 30/9/2014]

³¹ <http://www.greentechmedia.com/articles/read/are-renewables-really-making-germany-uncompetitive> [accessed 3/9/2014]

³² <http://blogs.cfr.org/levi/2014/01/22/is-europes-renewables-mandate-bad-for-the-environment/> [accessed 3/9/2014]

³³ <http://www.robertstavinsblog.org/2014/01/18/will-europe-scrap-its-renewables-target-that-would-be-good-news-for-the-economy-and-for-the-environment/> [accessed 3/9/2014]



	onsultations/2010_10_31_iluc_and_biofuels_en.htm	
Energy Roadmap 2050	http://ec.europa.eu/energy/energy2020/roadmap/index_en.htm	General Strategy
EC study 2050 Energy Roadmap	http://www.greenpeace.org/eu-unit/en/Publications/2011/2050-energy-roadmap/	General Strategy
EP Policy Department study on Biofuels (found in Research and Energy Committee)	http://www.europarl.europa.eu/RegData/etudes/etudes/join/2007/385642/IPOL-ITRE_ET(2007)385642_EN.pdf	Key policy department
EP Policy Department study on Biofuels (found in Environment Committee)	http://www.europarl.europa.eu/RegData/etudes/workshop/join/2013/492476/IPOL-ENVI_AT(2013)492476_EN.pdf http://www.europarl.europa.eu/RegData/etudes/workshop/join/2012/475090/IPOL-ENVI_AT(2012)475090_EN.pdf http://www.europarl.europa.eu/RegData/etudes/etudes/join/2011/451495/IPOL-JOIN_ET(2011)451495_EN.pdf http://www.europarl.europa.eu/RegData/etudes/etudes/join/2008/404905/IPOL-ENVI_ET(2008)404905_EN.pdf http://www.europarl.europa.eu/RegData/etudes/divers/join/2008/404887/IPOL-ENVI_DV(2008)404887_EN.pdf	Evolution of study
Media and press releases		
EP press	http://www.europarl.europa.eu/sides/getDoc.do?pubRef=-%2f%2fEP%2f%2fTEXT%2bIM-PRESS%2b20140121IPR33311%2b0%2bDOC%2bXML%2bV0%2f%2fEN&language=EN	
Euractiv	http://www.euractiv.com/energy/big-guns-fire-crucial-2030-re-news-532608	
	http://www.reuters.com/article/2014/01/10/eu-idUSL6N0KK14B20140110	Useful for sentiment analysis - as divisions provide excellent opportunities for debate
European voice	http://www.europeanvoice.com/page/european-voice-search-result/162.aspx?LG=1&sText=biofuels&OrderBy=Relevancy	290 news items on biofuels
Euroobserver	http://euobserver.com/search/text/biofuels/sort/relevance	158 news items on biofuels
Lobbyists		
Greenpeace	http://www.greenpeace.org/eu-unit/en/blog/exclusive-leaked-nuclear-state-aid-proposals-/blog/45995/	Article on the EC support for nuclear power industries



Renewable energy world	http://www.renewableenergyworld.com/rea/news/article/2013/05/eu-debate-over-climate-change-policy-could-dampen-renewable-energy-growth	A good format to see the more immediate socio-political impact of such policies
Various stakeholders	http://ec.europa.eu/transparencyregister/public/consultation/search.do#searchResult	Provides details of registered lobbyists, organisations, etc. in relevant fields
Related public debate		
Polish Economic Forum	http://www.forum-ekonomiczne.pl/8th-energy-forum/debates-of-energy-forum/renewable-energy-sources-climate-policy-ecology-and-environmental-protection/?lang=en#.UvzghGRdWuA	In-depth economic approach

Table 7: Online resources on EU renewables policy

4.1.2.6 Easily defined parameters

This is an issue that is likely to stretch across a number of different areas from economy and energy policy to climate change and the environment. This makes the parameters hard to define but makes it a policy that could be a robust test for the Sense4us policy modelling tool that has to be able to combine various factors and come up with a reasoned policy projection.

4.2 Policy scenario: National level (UK) – renewable energy targets 2030

4.2.1 Context

The EU is committed to reducing greenhouse gas emissions by 80-95% (from 1990 levels) by 2050. The first emission reduction targets committed most European member states to a reduction of 8% on 1990 levels. They were agreed in 2004 and covered the period to 2012.

For 2020 the EU has committed to making emissions reductions of 20% on 1990 levels, increasing this target to a reduction of 30% if other countries across the world make comparable reductions. The targets are binding and include additional commitments to a 20% improvement in energy efficiency as well as raising the EU share of energy consumption to 20% from renewables.

The targets aim to combat climate change, strengthen competitiveness and increase energy security. It is estimated that the targets will account for an estimated 400,000 additional jobs created across the EU.³⁴

Four pieces of complementary legislation have been put in place to deliver these targets:

1. National renewable energy targets;
2. National targets for non-EU emissions trading scheme targets;

³⁴ See: p. 195, European Commission Impact Assessment (working document) Accompanying the Communication A policy framework for climate and energy in the period from 2020 up to 2030, Brussels 2014: http://ec.europa.eu/clima/policies/2030/docs/swd_2014_xxx_en.pdf [accessed 9/9/2014]



3. Reform of the EU emissions trading system;
4. Carbon capture and storage.

The 2030 framework is currently being negotiated with national governments but proposals from the European Commission include:

1. A target to reduce EU greenhouse gas emissions to 40% of 1990 levels;
2. A commitment to increasing the share of renewable energy to 27%;
3. Increasing energy efficiency by 30%;
4. Reform of the Emissions Trading System to reduce surpluses that have built up and which are currently making the system ineffective.

4.2.1.1 The UK government's perspective on the 2030 targets³⁵

The information in this section is a summary of the UK government's position on the 2030 targets based on their formal response to the European Commission's Green Paper consultation.

Targets

The UK government supports GHG reduction targets of 40% set unilaterally across the EU in order to meet 2050 emissions targets. The EU should move to a 50% target for emissions reductions if there is comprehensive global agreement on climate change, where developed countries commit to similar reductions to EU countries and developing countries also commit to making reductions.

However, the UK government is not supportive of specific targets for renewable energy or energy efficiency (the Czech Republic is the only other member state to take this perspective). The 2020 framework highlighted the need to be flexible and allow member states to meet targets in ways that were most appropriate for their circumstances, using different technologies, in different proportions, and at different times. The UK government believes that a renewables target would constrain the technologies available for member states to use and would not allow emissions to be cut in the most cost effective way.

Cost and competitiveness

Any EU decisions to combat climate change and increase energy security must take account of the costs of meeting these targets, and the impact that this could have on the competitiveness of the EU. The EU must be able to compete with other developed and developing nations, such as the US, where shale gas has provided a substantial cost advantage in fuel prices. All EU policies must be focused on cost effectiveness and maximizing economic efficiency.

Emissions Trading Scheme

The UK government believes that the ETS as it stands is ineffective and in need of reform. They argue that the emissions cap is currently set too high and the carbon price is too low, providing little incentive for low carbon investment. Changes to the ETS should be made to increase GHG emission reduction targets for 2020 to 30%. If this is not forthcoming, a large amount of EU surplus allowances for the ETS should be cancelled to rebalance supply and

³⁵ See: *A 2030 framework for climate and energy policies UK Government Response to Commission Green Paper COM(2013) 169*, Department for Energy and Climate Change, 1 July 2013: <https://www.gov.uk/government/publications/uk-summary-of-analysis-on-2030-ghg-targets> [accessed – 29/8/2014]



demand within the ETS. These measures should be put in place as soon as possible, and certainly before 2020.

Changes to the ETS should be supported by policies designed to reduce emissions and create energy efficiency where it is most cost effective to do so. This will often be best implemented at member state level but the EU has a part to play in certain areas e.g. product standards and working towards a single market for energy, which will integrate the low carbon economy, reduce energy prices and improve energy security. This is vital for a competitive EU.

Flexibility

The UK government believes the EU will need to pursue a wide range of low carbon technologies to reduce carbon emissions cost-effectively, maintain energy security and supply, whilst avoiding carbon leakage, because:

- Allowing a number of markets to develop introduces competition which drives down prices for new green technologies and low carbon energy;
- A diverse range of low carbon technologies limits dependence on one energy source or technology, including fossil fuels;
- There are still significant uncertainties around which technologies will meet our future needs – focusing on one technology may risk not developing others that may better suit our needs;
- As we decarbonize, physical limitations such as land area or geography may limit the use of certain technologies;
- Climate change policies can have an impact on industrial electricity prices, leading to the risk of carbon leakage.

As global leaders in decarbonisation, the EU must play a central role in developing all renewable technologies.

Setting renewable energy targets could risk unnecessary subsidies, conflict with the creation of a mature, sustainable and competitive low carbon market and upset the EU ETS, making energy more expensive at a time when budgets are being squeezed. Flexibility is key – the EU should not pre-judge whether energy efficiencies or other low-carbon measures would be more effective in reducing carbon emissions.

The UK government wants the EU to concentrate on actions that enable member states to coordinate their efforts by:

- Supporting R&D – focusing on cost reduction, whole energy systems as well as individual technologies and be able to adapt to new opportunities and priorities;
- Setting product standards, especially in energy performance, across the EU;
- Coordinating the measures of member states on cost-effective reductions and energy supply;
- Ensuring state aid rules³⁶ are effective in allowing member states to provide support for low-carbon technologies of all types.

Although the UK government does not want legally binding targets for renewable energy share or energy efficiency, it is unlikely that its position will attract sufficient support at forthcoming EU Council meetings as most other member states support the three binding targets as set out in the original policy.

³⁶ For more on state aid: http://ec.europa.eu/competition/state_aid/overview/index_en.html [accessed 3/9/2014]



4.2.1.2 Policy timeline

Date	Policy action
27/3/2013	Green Paper – a 2030 framework for climate and energy policies – released
28/03/2013 – 02/07/2013	Green Paper consultation held
25/9/2013	Report of consultation released - 556 contributions received from individuals and organizations across Europe
22/1/2014	European Commission Impact Assessment released
5/2/2014	European Parliament voted in favour of more ambitious binding targets than the European Commission – 40% cut in GHG, 40% improvement in energy efficiency and 30% of energy to come from renewable sources by 2030. MEPs also voted to require binding national renewable energy targets rather than one target for the EU as was proposed in the Commission’s policy documents. The European Council has the final say on whether there will be binding national targets.
20/21 March 2014	European Council met to discuss the proposal
26/27 June 2014	European Council met to discuss the proposal
October 2014	EU leaders to take a final decision on the framework

Table 8: European policy timeline

4.2.2 How does this scenario meet the criteria?

The aim of the policy scenarios is to drive the research and development of a Sense4us tool that supports policy-makers and decision-makers in their work. The evaluation of the 2030 renewable energy targets below explains how the renewable energy targets policy scenario meets the criteria set out in section 2.4.

4.2.2.1 Relevance of the policy scenario

As an issue, climate change and the future impact of GHG emissions on our world is one of the biggest strategic challenges facing countries worldwide. The problem is one that is relevant to citizens and governments around the world, and an issue that is a long-term challenge. It will take persistent effort to achieve change on an issue which necessitates cross-border cooperation, changes to the way we organize our societies and high levels of innovation and ingenuity. This makes the 2030 targets and a switch to renewable energy from fossil fuels, relevant to governments, businesses, communities and individuals.

Government

As it looks likely that all EU member states will be required to provide a national plan for how they will achieve the 2030 targets, the Sense4us tool could support policy-makers in refining their policy options around this scenario. There are currently many debates in the UK about which technologies should be part of the UK energy mix – the government is currently keen



to support investigations into the extract of shale gas despite this being an unpopular option with the public³⁷.

Energy is an important policy area for government as they play a key role in setting a regulatory framework for energy companies, as well as providing subsidies for new renewable technology and measures to improve energy efficiency. In recent years household energy prices have been a politically controversial topic, with the government and the main opposition party strongly disagreeing on the right measures to tackle increasing prices paid by consumers. Rising energy prices provide an additional incentive to broaden the energy mix, improve energy efficiency and encourage citizens to take advantage of subsidized renewable energy measures, such as solar panels on their homes.

Citizens

In the UK, renewable energy is a topic that is relevant to citizens for a number of reasons:

1. new energy sources (wind farms, nuclear power stations) need to be built somewhere, and because the UK has relatively high population density, this means that inevitably they will be near some people's homes;
2. the recession has increased the focus on the cost of energy and fuel poverty as part of the cost of living debate – an issue exploited by the opposition Labour party at the expense of the government in late 2013/early 2014;
3. citizens are broadly supportive of renewable energy – 82% support the use of solar, 72% off-shore wind, 67% on-shore wind – compared to 25% that support the extraction of shale gas (a fossil fuel);³⁸
4. fuel security is also important to citizens³⁹ – given worsening international relations with Russia and instability in the Middle East, fulfilling more of our energy needs from domestic supply is likely to become even more of a priority.

These factors, and the number of environmental campaign groups that represent citizens' views, suggest that this is a relevant policy for citizens and that they are likely to be supportive of co-operation to set and achieve renewable targets for 2030.

Media

Media attention focuses on particular policy areas as and when new issues or events emerge that make them particularly topical and news-worthy. On this issue, it is therefore likely that media interest will be aroused when the process of agreeing the targets moves forward. There is also likely to be coverage of the UN climate talks in New York in September 2014 and the Paris climate conference in December 2015 – these events should also create interest on social media.

Although *The Guardian*, *BBC* and *The Telegraph* all have news hubs for energy related news stories and commentary, the issue of environmental targets for 2030 is only likely to become mainstream news when policies directly affect citizens – this happened in the UK when it was

³⁷ DECC survey August 2014:

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/342426/Wave_10_findings_of_DECC_Public_Attitudes_Tracker_FINAL.pdf [accessed 02/09/14]

³⁸ Ibid.

³⁹ 82% of respondents to a UK Energy Research Centre survey were concerned about the UK becoming too dependent upon energy from other countries: <http://www.ukerc.ac.uk/support/article3045-New-UKERC-research-defines-values-which-determine-public-acceptance-of-energy-system-change> [accessed 02/09/14]

announced that the EU was banning vacuum cleaners with motors larger than 1600 watts.⁴⁰ However, as decisions are made by the government about how to actually achieve renewables targets, this may prompt media coverage, due mostly to the impact that energy sources such as solar farms and wind farms will have on citizens living close to such developments. This interest can be seen in current debate about the extraction of shale gas in the UK, particularly the government's controversial plans to change trespass laws to allow fracking companies to drill under people's homes without their permission. As new technologies and sources of energy emerge, and the government feels increasing pressure to reduce GHG emissions as well as make the energy supply more secure, reliable and cheaper, the debate about the UK's energy mix is likely to gain a higher profile in the UK.

4.2.2.2 Willingness of end users to engage

Energy and the environment are broad policy areas that have many end users responsible for them in different UK institutions. There is an entire government department dedicated to energy and climate change (DECC), a parliamentary committee tasked with scrutinizing their work and a number of related arm's-length bodies⁴¹ that monitor or deliver services. The range of end users involved in this area is detailed in section 4.2.3.

The policy of renewable targets for 2030 is not likely to be a priority area for the government in terms of immediate short-term concern but this is likely to be beneficial for the Sense4us project as it makes it relatively non-controversial compared to other issues such as welfare or tax policies. The UK has been signed up to binding European climate change targets for many years, along with other international agreements on emissions, and there is a broad political consensus for the need to make continuing efforts to address these issues (even if there is disagreement about the mechanisms and the extent to which they are pursued).

In addition, end users that were spoken to in the requirements gathering process identified the environment as a complex policy area where policy-makers would benefit from having the support of a Sense4us tool to help them navigate the range of information available to develop policy and understand the long-term impacts of different policy options. Of all end users that responded to the survey, *Europe* (88%) and the *Environment* (61%) were selected as the first and fourth of the top five policy areas that they thought were most challenging to understand the consequences of. This gives a high level of certainty that the policy scenario will be of interest to a number of end users and that they will be willing to engage with the project.

DECC has in the past created its own policy modelling tool, the *2050 carbon simulator*⁴², to engage with climate and policy experts and the public. It allowed policy-makers and citizens to create their own UK emissions reductions strategy by changing the future energy mix, allowing them to see the impact of policy changes using real scientific data. As the Sense4us tool has some similarities to the carbon calculator project, this might encourage the policy-makers involved to engage, as it would add value and a new perspective to a project which was deemed a success by those involved.

⁴⁰ See: <http://www.bbc.co.uk/news/business-29021886> & <http://www.dailymail.co.uk/news/article-2738082/The-great-vacuum-cleaner-stampede-Panic-buying-hits-shops-deadline-looms-Brussels-ban-high-powered-machines.html> [accessed 02/09/14]

⁴¹ List of UK Government departments, agencies and bodies: <https://www.gov.uk/government/organisations> [accessed 1/9/2014]

⁴² Details about the calculator: <https://www.gov.uk/2050-pathways-analysis> [accessed 07/08/2014]



Based on informal discussions with departmental sources, the Hansard Society has been reassured that, as the government is currently developing its policies around the EU targets for 2030, this policy use case is likely to be of interest to those responsible for this policy within the department.

4.2.2.3 Longevity of the issue or policy

The issues of climate change, emissions and which energy sources we develop are long-term policy challenges, none of which are going to be solved soon, by one policy, institution or even one country. This is an advantage for this policy test case as we know that EU targets are likely to be on the political agenda no matter which party wins the general election in 2015, and there is a timetable at the EU level setting out when decisions are to be made. Although a number of the decisions have already been made, each member state is likely to need to create their own plan to meet the targets. Sense4us could assist the UK government in simulating various strategies for meeting the 2030 targets, contributing to long-term environmental policy.

This policy is a relatively risk free test case in terms of being affected by events – most of the environmental events (such as flooding that severely affected the UK in 2013/14) will bolster the view that climate change is a serious and immediate threat. This may make it easier for politicians to make the case for the targets and increasingly ambitious plans to mitigate the threats of climate change.

4.2.2.4 Availability of policy alternatives

One of the benefits of using the 2030 targets as a policy test case, and looking at the policy in this stage in its development, is that most of the groups involved have already stated their position in response to the European Commission's *Green Paper: A 2030 framework for climate and energy policies*.⁴³ There is a record of the perspectives of most member states, as well as the NGOs, business groups, trade unions and citizens that participated in the consultation.⁴⁴ This means that potential policy alternatives are considerable as there were over 500 submissions to the consultation process, with many of those that submitted evidence having conducted or commissioned research on the outcomes of the targets and their likely impact on the climate in the future.

Although the UK government commissioned a research consultancy to provide evidence and a cost benefit analysis of the impact of the 2030 targets on each of the member states,⁴⁵ alternative models have been created that use different data, ask different questions, and include alternative factors and variables. For instance, issues with respect to land use and forestry are not included in the Enerdata report, mentioned above, which may be affected by the 2030 targets in many member countries.

⁴³ European Commission, GREEN PAPER: A 2030 framework for climate and energy policies, COM(2013) 169 final, 27/03/2013 Brussels: <http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52013DC0169&from=EN> [accessed 09/09/2014]

⁴⁴ Details of the public consultation and responses from organisations across the EU: http://ec.europa.eu/energy/consultations/20130702_green_paper_2030_en.htm [accessed 04/09/2014]

⁴⁵ *Costs and Benefits to EU Member States of 2030 Climate and Energy Targets* – Enerdata, February 2014: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/285505/costs_benefits_eu_states_2030_climate_and_energy_targets_enerdata_report.pdf [accessed 04/09/2014]



The alternative options put forward by environmental campaign groups, business associations and other member states could therefore form the basis of alternative scenarios. For example, the UK based environmental campaign groups, Action Aid, Greenpeace, Friends of the Earth and the World Wildlife Fund, all wanted to see a commitment to binding and ambitious renewable energy targets of 45% rather than the 27% that was initially suggested by the Commission.

4.2.2.5 Availability of relevant data

As is mentioned above, a number of research consultancies were commissioned by those inside and outside government to seek to understand the impact that the 2030 targets would have on different countries, industries and actors. This means that there is a larger evidence base than there may have been for other policies and that the research that has been commissioned is focused very closely on the 2030 targets.

In addition climate change and GHG emissions have been measured for many years and form part of the UK's official statistics repository. All emissions targets use 1990 as a base so there is almost 25 years' worth of comparable data that has been collected to support the emissions reduction targets.

Key data sets for this policy scenario are:

Publisher	Description	Link
National Atmospheric Emissions Inventory	UK emissions statistics collected by the NAEI published by DEFRA and DECC on an annual basis	http://naei.defra.gov.uk/data/
Office for National Statistics	Sustainable development indicators	http://www.ons.gov.uk/ons/rel/wellbeing/sustainable-development-indicators/july-2014/sustainable-development-indicators.html
Office for National Statistics	UK environmental accounts	http://www.ons.gov.uk/ons/rel/environmental/uk-environmental-accounts/2014/stb-stat-bulletin.html
Office for National Statistics	UK energy consumption	http://www.ons.gov.uk/ons/search/index.html?newquery=energy+consumption
Department for Energy and Climate Change	UK greenhouse gas emissions 2006-2014	http://data.gov.uk/dataset/uk_greenhouse_gas_emissions
Department for Energy and Climate Change	Contribution of renewable energy sources to UK energy mix	https://www.gov.uk/government/statistics/renewable-sources-of-energy-chapter-6-digest-of-united-kingdom-energy-statistics-dukes
Department for Energy and Climate Change	Renewables obligation: certificates and generation	http://data.gov.uk/dataset/renewables_obligation-



		certificates_and_generation
Department for Energy and Climate Change	Renewables map - shows the status of renewables projects in the UK	http://restats.decc.gov.uk/app/pub/map/map/
Department for Energy and Climate Change	Energy trends - renewables	https://www.gov.uk/government/statistics/energy-trends-section-6-renewables
Committee on Climate Change	UK emissions by sector	http://www.theccc.org.uk/charts-data/ukemissions-by-sector/
Committee on Climate Change	Adaptation indicators	http://www.theccc.org.uk/charts-data/adaptation-indicators/
Intergovernmental Panel on Climate Change	Computer simulations on climate change and emissions	http://www.ipcc-data.org/
Department for Environment, Food and Rural Affairs	The UK Renewable Energy STATISTICS database	http://data.gov.uk/dataset/the-uk-renewable-energy-statistics-database
Department for Environment, Food and Rural Affairs	The UK Renewable Energy Planning Database	http://data.gov.uk/dataset/the-uk-renewable-energy-planning-database

Table 9: Key datasets 2030 renewables targets - UK

In addition to datasets designed to be machine readable there are a number of policy documents and research reports that could be used with the topic analysis component to discover more relevant datasets and sources. A list of the most relevant policy documents can be found in section 6.

4.2.2.6 Easily defined parameters

Climate change and energy policy are large issues that cut across departmental and indeed geographical boundaries. However, in order to make the policy scenario manageable, it will be necessary to separate the core factors from more peripheral concerns.

Core factors may include:

- GDP impact – will the policy increase or decrease GDP? How does this change over time?
- CO2 emission reduction
- Land use change – do changes in land use have significant consequences on other factors?
- Impact on nature, wildlife or ecosystems – does the policy have an impact on the wider environment?

More peripheral factors could include:

- Energy security
- Flexibility – can production be increased or decreased as needed? To what limits?



- Fairness – might costs be borne disproportionately by some actors or industries?
- Reversibility - can the policy be reversed without significant costs or knock-on effects?

4.2.3 End user mapping

The organisations and end users identified below are an indication of those that will be contacted during the next phase of engagement. The list is not exhaustive and is intended to be added to as contacts are met and we build networks within the environmental and renewable sectors.

Organisation	Specific end users	Type
DECC	Rt Hon Ed Davey MP – Secretary of State for Energy and Climate Change – responsible for 2050 pathways, renewable energy strategy	Government
DECC	Head, European Policy Head, Renewables Delivery Deputy Director, Strategy Head, Climate Science and International Evidence	Government
Select Committee on Climate Change	Committee members Committee secretariat	Independent statutory body
Energy and Climate Change Committee	Committee members Committee secretariat	Parliament
All Party Parliamentary Group on Climate Change	Group members Group secretariat	Parliament/ External
All Party Parliamentary Group on Energy Costs	Group members Group secretariat	Parliament/ External
All Party Parliamentary Group on Energy Intensive Industries	Group members Group secretariat	Parliament/ External
All Party Parliamentary Group on Fuel Poverty and Energy Efficiency	Group members Group secretariat	Parliament/ External
All Party Parliamentary Group on Renewable and Sustainable Energy	Group members Group secretariat	Parliament/ External
House of Commons Library	Environmental specialists	Parliament
House of Lords Library	Environmental specialists	Parliament
Parliamentary Office of Science and Technology	Environmental specialists	Parliament

Table 10: End user mapping - UK

4.2.4 Next steps for engagement

The next stage of engagement will be to contact end users that have been identified as being responsible for this policy or having some input into its development and discuss what the Sense4us project aims to do. We will then ask them for their feedback on the requirements gathered so far, as well as show them a prototype loaded with data about the 2030 renewable targets, which should make the tool seem as relevant as possible to them.

It will be necessary to attend events and to reach out beyond the group of policy-makers and decision-makers discussed in section 4.2.3, but they will be the starting point for engagement. We will also revisit contacts made in the original phases of engagement asking them for their feedback on the prototype. Engagement will continue and iterations to the tool will be made after each phase.

Feedback is likely to be gathered through telephone or face-to-face meetings but focus groups and presentations at events and conferences are also a possibility. The type of engagement will be determined by the end users themselves as we need to make it as easy as possible for them to engage with Sense4us.

4.3 Policy scenario: State level (Germany) – Implementation of renewable energy in North Rhine-Westphalia

4.3.1 Context

The policy scenario for the state level in Germany covers the *implementation of renewable energy in the state North Rhine-Westphalia*. Part of this development plan is the motion *promoting renewable energy in North Rhine-Westphalia using a virtual power station pilot*, which were filed within the current 16th legislative period by the Social Democrat and the Green factions of the State Parliament of North Rhine-Westphalia. The motion was published on 27/05/2014 under the printing matter Drs. 16/5967⁴⁶ and got universal acceptance by the State Parliament's plenum on 05/06/2014.⁴⁷ This motion exemplified a real case, which is planned for the pilots with end users in Germany. The important facts will be described within this section. Beside this motion the State Parliament North Rhine-Westphalia regularly works on alternative motions. A selection that can also be used as a real case for the pilots is listed in section 4.3.2.4. In the following sections the term policy scenario is used to refer to the *implementation of renewable energy in the state North Rhine-Westphalia* and, as more broadly interpreted, *promoting renewable energy in North Rhine-Westphalia using a virtual power station pilot*.

Background: Electricity production is currently under structural reorganization in Germany. Nuclear energy is planned to be switched-off and renewable energy is planned to work as alternative technology. There are already many renewable energy power plants and more and more are scheduled to be built, but they are often peripheral. Consequently there are new requirements concerning the electricity network to guarantee its stability and economic efficiency.

Approach: One opportunity to run a stable and economically efficient electricity network is to combine the peripheral sources within one virtual power plant. The aim is a combination of peripheral supplier, especially for renewable energy, which handles the base load of the electricity network. For this purpose the peripheral sources (e.g. wind or solar energy) need to be connected with adjustable electricity and thermal producing biomass power stations, combined heat and power stations, and flexible storages or fossil power plants.

⁴⁶ See: <http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/MMD16-5967.pdf> [accessed 30/08/2014]

⁴⁷ See p. 12f: <http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/ZLANIN147.pdf> [accessed 31/08/2014] and the 61st meeting of the plenum of the State Parliament of North Rhine-Westphalia: http://www.landtag.nrw.de/portal/WWW/GB_I/I.1/Tagesordnungen/WP16/001/PT16-61.jsp [accessed 31/08/2014]

Preparation: The federal faction parties CDU/CSU and SPD have defined within their coalition agreement that new stations need to be connected with network operators and supplier of electric energy.

Aim: The State Parliament of North Rhine-Westphalia requests the government of North Rhine-Westphalia:

- to support the approach on the federal level for realizing at least one pilot in North Rhine-Westphalia;
- to support the implementation of the “virtual base load” for renewable energy provider, which is part of the federal coalition agreement, also in North Rhine-Westphalia;
- to manage the requirements in practice, together with the power industry and municipalities, for implementing a project in North Rhine-Westphalia that realizes a feasibility study.

4.3.2 How does this scenario meet the criteria?

4.3.2.1 Relevance of the policy scenario

The scenario *promoting renewable energy in North Rhine-Westphalia using a virtual power station pilot* is relevant to end users in North Rhine-Westphalia. This includes decision-makers and citizens. The EU directive 2009/28/EG⁴⁸ (2009), to increase the proportion of renewable energy as a share of total energy consumption (pre-tax) by at least 18%, has put Germany on the spot. Policy-makers are requesting that Germany achieve this objective. In principle accountability lies with the German Bundestag, but in practice the federal states are challenging this given the electricity network structure (peripheral electric power supply) and potential negative effects of renewable energy power stations (e.g. potential air pollution, noise pollution or line-of-sight obstruction). North Rhine-Westphalia is the biggest state in Germany and shelters a huge industry within the dense population area of the Ruhr, which needs much energy. On the other hand the sparsely populated areas of NRW produce renewable energy and more and more citizens install small renewable energy power plants themselves (e.g. solar panels on the roof). But the electricity/energy that is produced cannot always be spent by the household itself (e.g. when the family is absent). If they sell their electricity surplus to a local energy provider, the households can earn money and profit from the plant. Companies like Next Kraftwerk⁴⁹ (English: next power plant) have built their business model on this approach. In practice there are lots of challenges with this approach (e.g. the peripheral electric power supply). Therefore policy-makers and citizens, who are responsible or affected by this scenario have a strong interest in the process of virtual power stations.

4.3.2.2 Willingness of end users to engage

The scenario *promoting renewable energy in North Rhine-Westphalia using a virtual power station pilot* involves at least six different roles. The following Figure 4 shows three NRW actors that influence the policy scenario directly: [1] MPs/factions who submitted the motion, [2] the MPs/factions who support the submission and [3] the ministries who provide expert knowledge. The first two roles get support by [5] committees/MPs’ office employees/external

⁴⁸ See: <http://www.umweltbundesamt.de/daten/energiebereitstellung-verbrauch/ausbauziele-der-erneuerbaren-energien> [accessed 1/09/2014]

⁴⁹ See: <http://www.next-kraftwerke.com/> [accessed 1/9/2014]

experts. The role [4] the Bundestag influences the scenario indirectly, because the Bundestag has the power to decide on related and dependent policies. Every single role is influenced by [6] public opinion (citizens, NGOs, bloggers)/interests of the media, the energy sector, lobbyists, but they do not decide directly on the policy. All relevant URLs with further information concerning the named decision makers and institutions can be found in section 4.3.3.

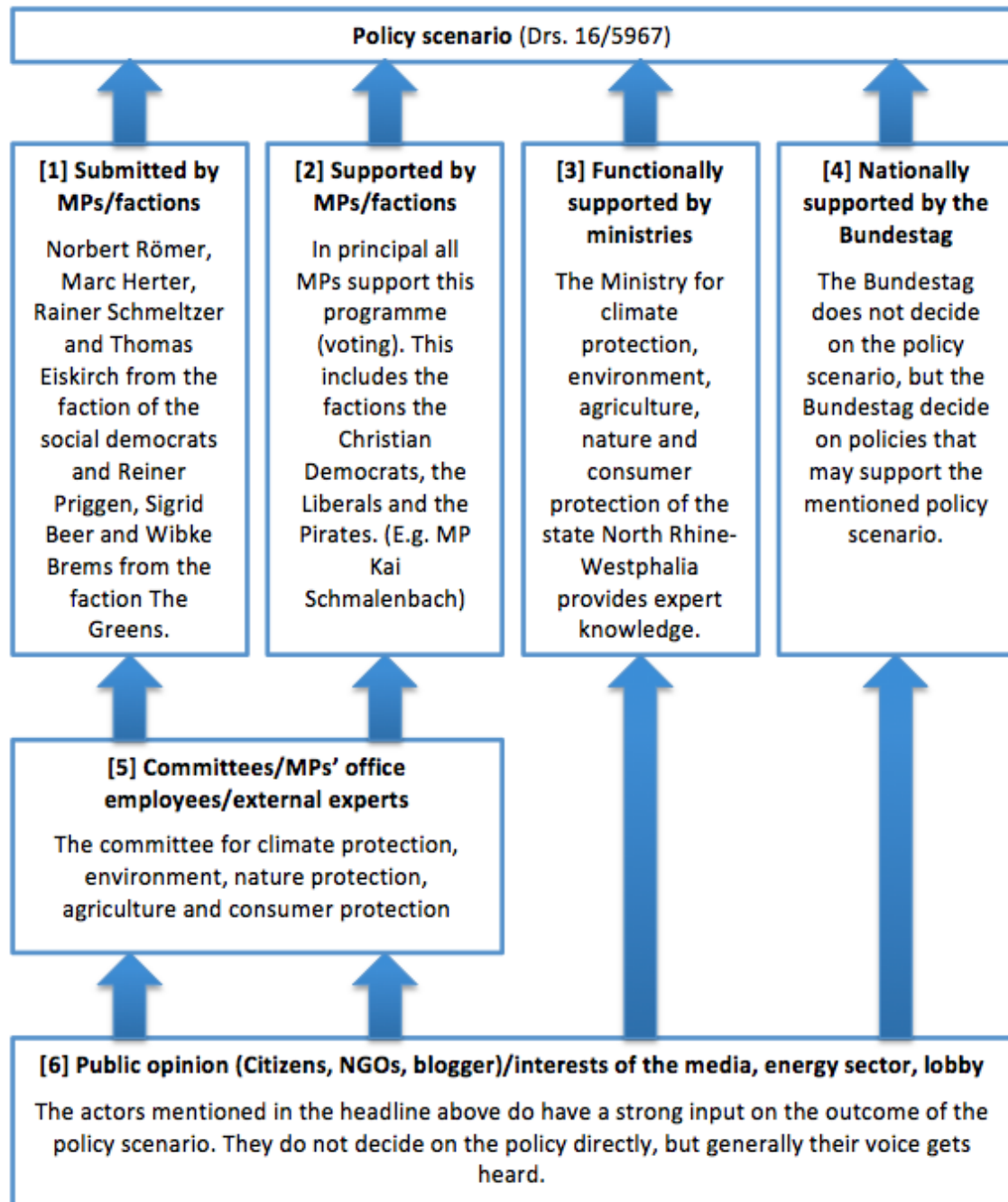


Figure 4: End user willingness to engage with the policy scenario

4.3.2.3 Longevity of the issue or policy

The policy scenario is a “strategy” regarding how renewable energy can, in practice, feed into the electricity network. The approach may solve the major problem of the peripheral electricity power supply. Therefore it is necessary to push this scenario forward and validate its pilot over a longer time frame. This policy should be active throughout the course of the Sense4us project but, if not, there are lots of related scenarios that could work within the same field, using the assets and data that will already have been developed or collected (e.g. selection of databases or search terms).

The two sections 4.3.2.1 and 4.3.2.2 justify that there is an interest and willingness for the different roles engaging within the scenario.

4.3.2.4 Availability of policy alternatives

Promoting renewable energy in North Rhine-Westphalia using a virtual power station pilot is an important step to increase the percentage of renewable energy in North Rhine-Westphalia. The following policies are related to this goal of increasing the percentage of renewable energy, and have been debated in the state parliament:

German renewable energy act (abbreviated in Germany to EEG)

EEG stands for the development of renewable energy in Germany.⁵⁰ It is common practice that MPs, parties and lobbyists regularly want to modify this law. The state North Rhine-Westphalia is the biggest producer of electricity in Germany. Therefore changes concerning EEG would affect NRW very strongly. When the Bundestag decided to reform the EEG (27/06/2014) the Liberals in NRW requested an “urgent debate”.⁵¹

Pumped-storage hydro power plant

The downside with wind and solar energy is the dependency on the weather. If there is no wind or it is cloudy, the technologies do not work. To guarantee stable electricity it is necessary to have electricity as required - this is very critical to prevent a potential blackout. Therefore the Social Democrats and the Greens submitted a motion to request the building of more pumped-storage hydro power plants.⁵²

Promoting the energy revolution by citizens

More and more citizens are taking an active role in the energy revolution. They are not only buying electricity produced by renewable energy technologies, they also invest private resources into renewable energy projects. One example is the gas-steam power plant within the harbour area in Düsseldorf. This power station will be built using the investments of

⁵⁰ See: http://en.wikipedia.org/wiki/German_Renewable_Energy_Act [accessed 1/9/2014]

⁵¹ See motion Drucksache 16/6191:
<http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/MMD16-6191.pdf> [accessed 1/9/2014]

⁵² See motion Drucksache 16/5969:
<http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/MMD16-5969.pdf> [accessed 1/9/2014]

citizens. The aim of this policy⁵³ is to mobilize citizens to take an active role in the energy revolution.

Reduce the usage of electricity

If electricity use is high and the portion of renewable energy needs to be increased, then the amount of renewable energy stations is problematic. Some of the policies mentioned above show that increasing the proportion of renewable energy is challenging. In addition to increasing the proportion of renewable energy, one approach is to save electricity. The Parliament looked at the biggest energy users in an attempt to understand if the usage could be reduced.⁵⁴

4.3.2.5 Availability of relevant data

For running the chosen policy issue or one of the related ones, during the pilots, it is critical to provide a sufficient volume of relevant open data. The relevance of data will be validated by the end users, who will be asked to participate in the pilots. Technically the data that is connected with the Linked Open Data Cloud can be potentially included in the hit list of the intelligent search tool (University of Koblenz). If relevant data is missing, because it is not or is not completely connected with the Linked Open Data Cloud, the sources can be transmitted into a machine-readable format and interlinked with the intelligent search.

The following Table 11 shows the key terms that are relevant for the motion (Drs. 16/5967) and gives an overview concerning the policy scenario. The first column shows the term's category (e.g. topic, geo location, MP or party). The second displays the English notation of the term (this is a translation of German terms that are used by decision-makers). The last column provides possible search terms that can be used as starting point for the intelligent search. Additionally these terms can be used to analyse and predict discussion dynamics and sentiment on Twitter. Because the terms are not geographically limited to the state of North Rhine-Westphalia the search term needs the query expansion NRW (the abbreviation for the state) or a filter to restrict the search to the geographic location. All of the data within this section will be updated and extended by policy-makers during the pilots. The aim is to enrich the policy scenario with real data to give technical Sense4us partners and end users a starting point to improve the tools.

Category	English notation	Twitter hash tag
Topic	Renewable energy	Erneuerbare Energien & #NRW #ErneuerbareEnergie & #NRW #EEG
Topic	Pilot project	
Topic	Virtual power plant	Virtuelles Kraftwerk & #NRW
Geo location	North Rhine-Westphalia (abbr. NRW)	#Nordrhein-Westfalen #NRW
Topic	Change on structural energy production	
Topic	Peripheral electric power supply	Dezentrale Stromversorgung & #NRW

⁵³ See minutes (motion Drucksache 16/3241):

<http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument?Id=MMA16%2F466|1|2&Id=MMA16%2F466|3|30> [accessed 23/9/2014]

⁵⁴ See motion Drucksache 16/6786:

<http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/MMD16-6786.pdf?von=1&bis=0> [accessed 23/9/2014]



Topic	Nuclear phase out	#Atomausstieg & #NRW
Topic	Obsolete power stations' switch off	alte Kraftwerke abschalten
Topic	Wind energy	#Windenergie & #NRW #Wind & #NRW
Topic	Solar energy	#Solarenergie & #NRW #Solar & #NRW
Topic	Water power station	#Wasserkraft & #NRW #Wasser & #NRW
Topic	Biomass	#Biomasse & #NRW #Biogas & #NRW
Topic	Fossil power stations	Fossile Energie & #NRW #Steinkohle & #NRW #Braunkohle & #NRW
Topic	Long-distance heating	#Fernwärme & #NRW
Topic	Heat and power stations (abbr. CHP)	#KWK & #NRW
Geo location	State parliament	#Landtag & #NRW #Landtag & #Düsseldorf
Geo location	Duesseldorf	#Düsseldorf
Faction party	SPD faction NRW	@spd_fraktion_nw
MP	Marc Herter	@marc_herter
MP	Thomas Eiskirch	@thomas_eiskirch
Faction party	The Greens Faction NRW	@GrueneFrakNRW
MP	Sigrid Beer	@beerenstark
MP	Wibke Brems	@wibkegt
Faction party	CDU faction NRW	@CDUNRW_Fraktion
MP	Thomas Kufen	@TKufen
Faction party	FDP Faction NRW	@FDPFraktionNRW
MP	Dietmar Brockes	@brockes
Party	Piraten NRW	@PiratenNRW
MP	Kai Schmalenbach	@Dave_Kay
Minister	Johannes Rimmel	@Minister_Rimmel

Table 11: Search terms local policy scenario

An interesting data source that was mentioned within the online survey is the GENESIS database:

By developing the Common New Statistical Information System (Gemeinsames Neues Statistisches Informations-System - GENESIS), the Federal Statistical Office and the statistical offices of the states have set up new information databases in order to make the wide range of official statistics available via the Internet in an easy-to-use manner. Currently there are two different Genesis databases containing statistical results for

*the states and the Federation municipalities, the regions, states and the Federation (Regional Database Germany).*⁵⁵

Following are some data examples, which are available within the data bases mentioned above. These results may be of interest for the policy scenario and could be part of the result list of the intelligent search tool.

Figure 5 shows a coloured map that displays the population density of all the municipalities in North Rhine-Westphalia. E.g. the yellow coloured municipalities on the right hand side hold the smallest population density. The ones in the middle, coloured in dark red, have the highest population density. This information could support decision-makers to identify the right regions for installing the right type of renewable energy; e.g. wind mills in the yellow parts and solar cells on the roofs of the dark red parts.

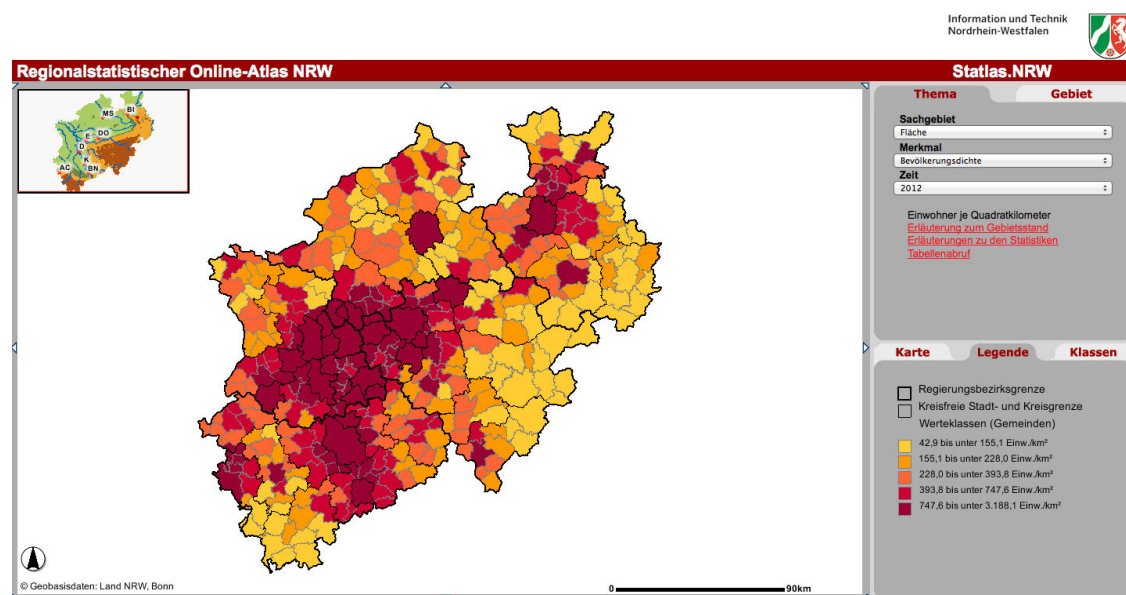


Figure 5: Municipalities in North Rhine-Westphalia⁵⁶

Figure 6 shows the proportion of the settlement and traffic area concerning the total area. The darker an area is, the higher the proportion of settlement and traffic. Areas that are coloured in dark green have the highest proportion of settlements and traffic in the total area. This information could support decision-makers to identify spots where charging stations for electric cars could be built.

⁵⁵ See: http://www.statistikportal.de/Statistik-Portal/en/en_GenesisUebersicht.asp [accessed 31/08/2014]

⁵⁶ See: <http://www.statlas.nrw.de/Statlas/viewer.htm> [accessed 31/08/2014]

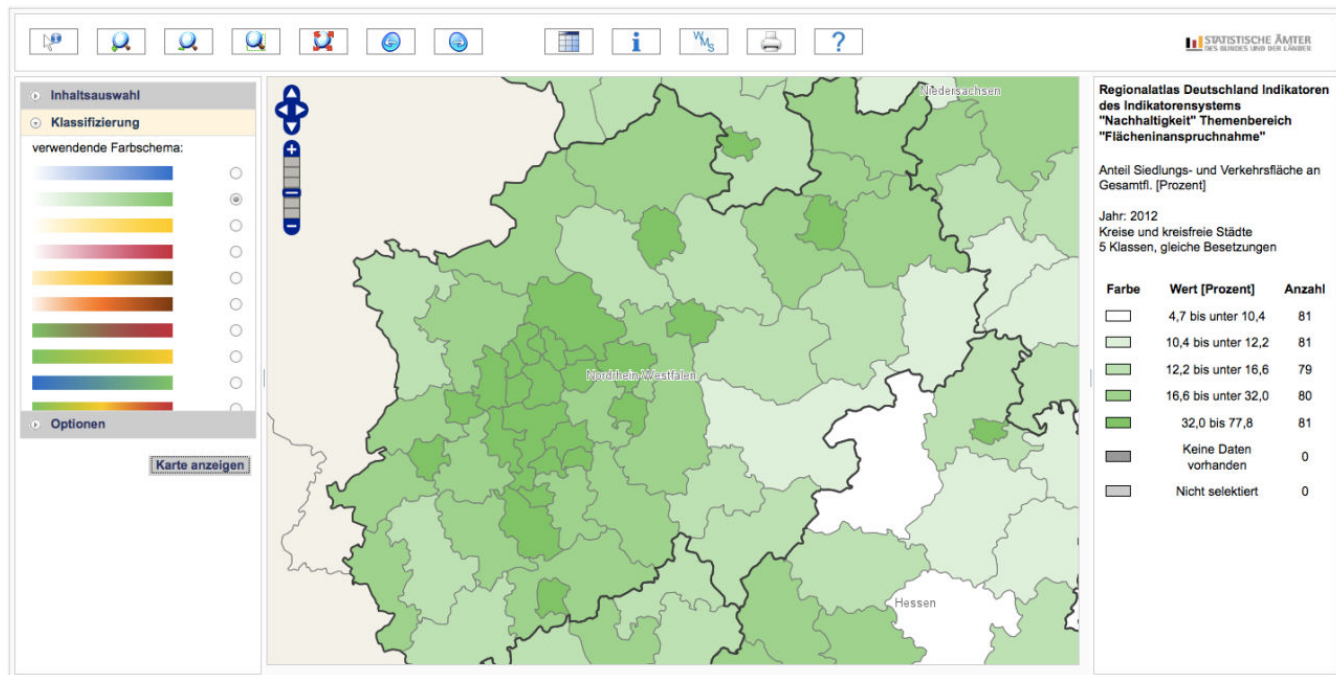


Figure 6: Proportion of the settlement and the traffic area concerning the total area⁵⁷

In addition to statistical data from databases (see Figure 5 and Figure 6) there exist alternative formats that provide relevant information for decision-makers. The online survey showed that text documents are often used (e.g. PDF documents) and Figure 7 and Figure 8^{Error! Reference source not found.} are part of the document *Renewable energies in North Rhine-Westphalia – growth and employment for the climate protection*,⁵⁸ which were published by the Ministry for Climate Protection, Environment, Agriculture, Nature and Consumer Protection of the state North Rhine-Westphalia.⁵⁹ This information may support the decision-maker to see the increase of solar, wind and biomass energy (Figure 7) and identify where renewable energy industry is already located (Figure 8^{Error! Reference source not found.}).

⁵⁷ See: <https://www-genesis.destatis.de/gis/genView?GenMLURL=https://www-genesis.destatis.de/regatlas/Al-N-01.xml&CONTEXT=REGATLAS01> [accessed 31/08/2014]

⁵⁸ See: http://www.umwelt.nrw.de/klima/pdf/ee_nrw.pdf [accessed 31/08/2014]

⁵⁹ See: www.umwelt.nrw.de/ [accessed 31/08/2014]

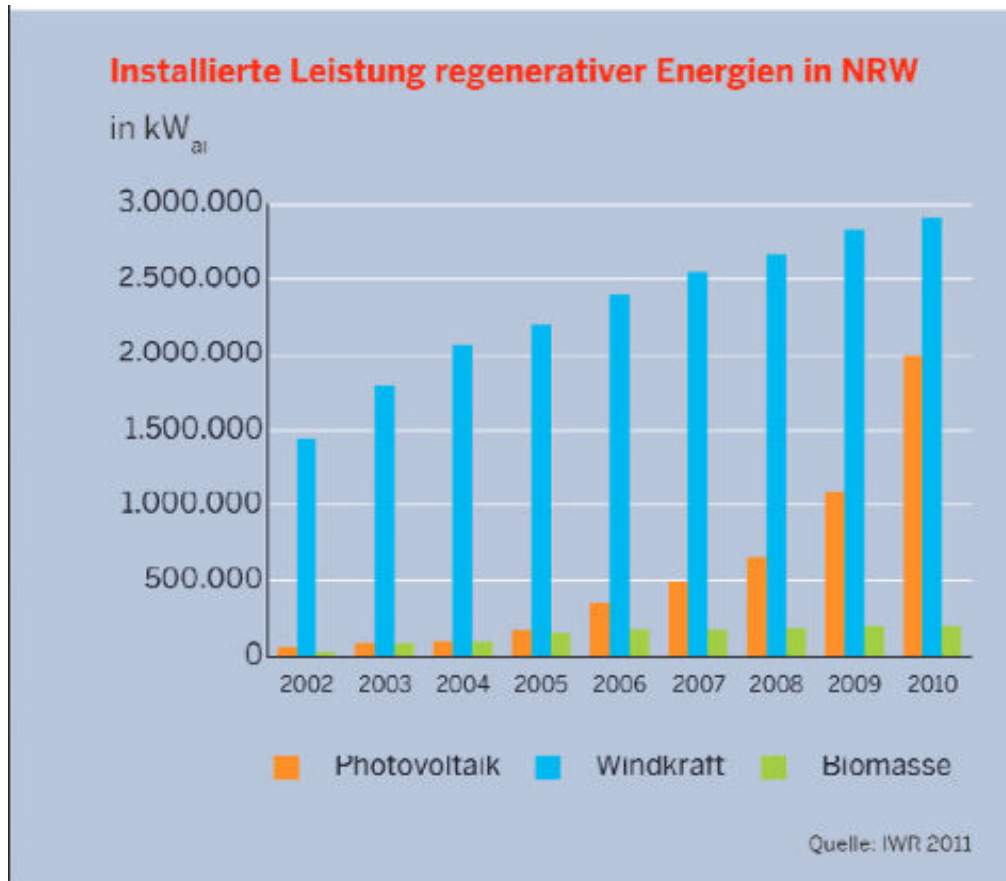


Figure 7: Renewable energy

NRW-Standorte der Regenerativen Energiewirtschaft

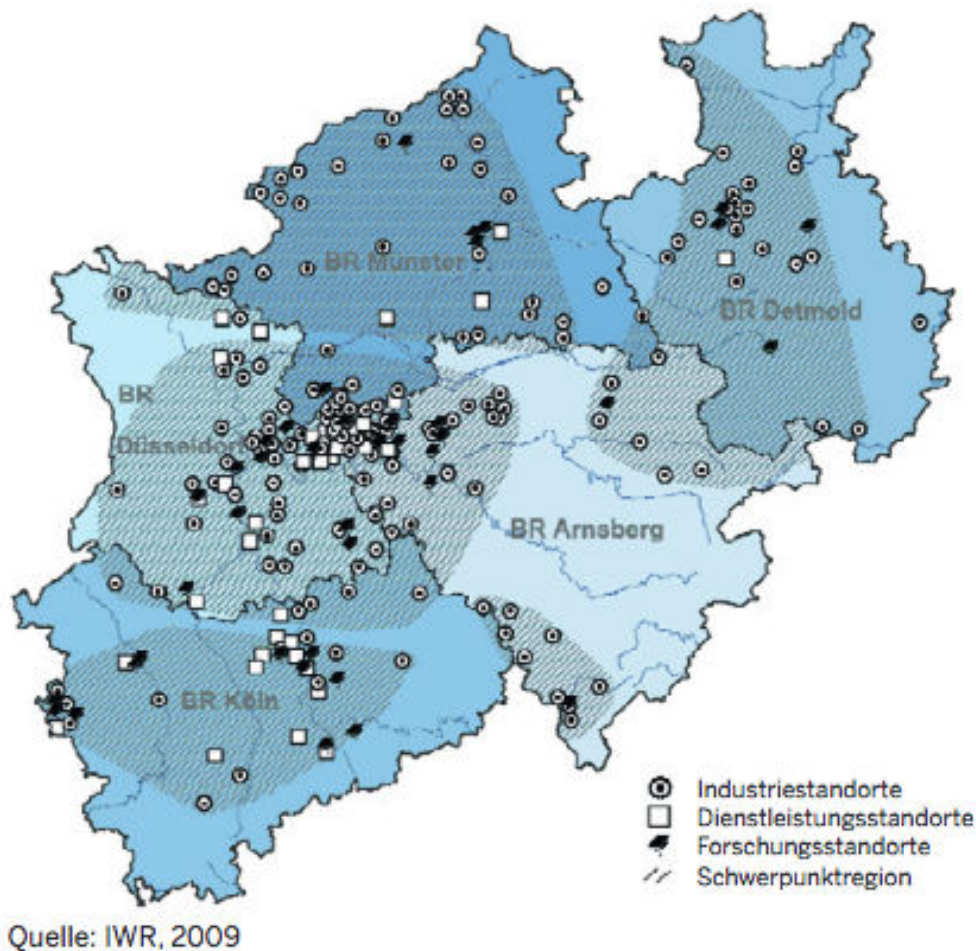


Figure 8: Locations for renewable energy industry

Twitter is a platform to get people's opinions concerning a particular topic within 140 characters. It is often the case that tweets include URLs that refer to concrete data sources or events, which are commented on by the Twitter user who sent it to their followers. Querying Twitter with some of the key hash tags, collected in Table 11, shows that the policy scenario has an impact on social networks.

For instance the search term "renewable energy NRW" provides different actors sharing opinion and information or promoting local offline events via Twitter.

- For instance the MP Stefan Engstfeld⁶⁰ (Green) acts as a local advocate for renewable energy in North Rhine-Westphalia. One of his recent tweets promotes the registered society National Association for Renewable Energy NRW⁶¹ (abbreviated to LEE NRW) and their invitation to discuss renewable energy in the state North Rhine-Westphalia.
- Identifying organisations like LEE NRW, show not only that policy-makers are debating renewable energy but also that NGOs are present on social networks regarding this policy issue. EnergieAgentur.NRW⁶² for example explains subtopics in

⁶⁰ Profile on Twitter: <https://twitter.com/Engstfelder> [accessed 23/9/2014]

⁶¹ See: <http://www.lee-nrw.de/> [accessed 23/9/2014]

⁶² Profile on Twitter: <https://twitter.com/EANRW> [accessed 23/9/2014]

the field of energy (e.g. solar energy) and provides information on complex technology.

- Citizens can find information on and discuss solar energy on Twitter and hear about opportunities to fund and support new green energies,⁶³ and ultimately how to profit from the energy revolution.
- Citizens and decision- makers find information on Twitter concerning the potential of solar energy. For instance the energy atlas NRW shows that North Rhine-Westphalia currently produces 3517 gigawatt hours of energy from solar sources.⁶⁴

4.3.2.6 Easily defined parameters

The scenario *promoting renewable energy in North Rhine-Westphalia using a virtual power station pilot* includes parameters that provoke debates, because the parameters can be seen as controversial. The scenario is an important step to increase the proportion of renewable energy in final energy consumption (pre-tax) to at least 18% (see EU directive 2009/28/EG).⁶⁵ Additionally Germany's goal is a reduction of greenhouse gas by 40% in the year 2020 based on 1990 levels.⁶⁶ Therefore potential parameters are:

Prevent blackout

- challenging with solar and wind energy;

Reduce CO2

- challenging with fossil energy that enables stable electrical power supply;

Reduce costs

- first costs can be high;
- but investigation may prevent follow-up costs of the climate change;

Create jobs

- New investigations keep jobs;

Involves citizens

- Citizens that produce homemade energy can earn money;
- Homemade energy producers are competitors for the energy industry.

4.3.3 End user mapping

The motion Drs. 16/5967, for *promoting renewable energy in North Rhine-Westphalia using a virtual power station pilot*, was submitted by Norbert Römer,⁶⁷ Marc Herter,⁶⁸ Rainer

⁶³ See: <http://www.energieagentur.nrw.de/foerderung/foerderung-von-solarthermischen-anlagen-2559.asp#socialmedia> [accessed 23/9/2014]

⁶⁴ See: <https://twitter.com/EANRW/status/512171359867506688> and <http://www.energieatlasnrw.de/site/nav2/KarteMG.aspx> [accessed 23/9/2014]

⁶⁵ See: <http://www.umweltbundesamt.de/daten/energiebereitstellung-verbrauch/ausbauziele-der-erneuerbaren-energien> [accessed 1/9/2014]

⁶⁶ See: https://www.bundestag.de/dokumente/textarchiv/2010/29574565_kw18_sp_klimaschutzgesetz/201642 [accessed 1/9/2014]

⁶⁷ Official website: www.norbert-roemer.de/ [accessed 31/8/2014]



Schmeltzer⁶⁹ and Thomas Eiskirch⁷⁰ from the Social Democrat faction and Reiner Priggen⁷¹, Sigrid Beer⁷² and Wibke Brems⁷³ from the Greens. Therefore these members of the State Parliament of North Rhine-Westphalia are potential end users for the Sense4us case in Germany. The MPs' faction parties – the Social Democrats and the Greens – are potential end users, because they push policy scenarios similar to the case above.

Because the motion was accepted unanimously, in principle all MPs support this programme. This includes the Christian Democrat, Liberal and Pirate factions who are therefore potential Sense4us end users in Germany. For example, MP Kai Schmalenbach mentioned that the petition is right, important and is of value to be supported within any doubt (see official website of the pirates).⁷⁴

Beside the caucuses the political debate is mainly going on within working parties. Here the petitions are prepared and developed by the committees. Currently the website of the State Parliament of North Rhine-Westphalia shows 27 committees.⁷⁵ The Committee for Climate Protection, Environment, Nature Protection, Agriculture and Consumer Protection⁷⁶ was engaged in the petition Drs. 16/5967. For instance the full member and speaker MP Henning Höne,⁷⁷ the full member MP Margret Vosseler,⁷⁸ and the deputy member MP Gabriele Hammelrath⁷⁹ were already engaged in further research projects. These members are also potential Sense4us end users in Germany. In addition to the policy scenario described above the committee is working on topics like *new unlimited uranium oxide intermediate store*⁸⁰, *support energy transition by citizens – supporting instead of preventing citizens' energy*

⁶⁸ Official website: <http://www.hammspd.de/marc-herter/> [accessed 31/8/2014]

⁶⁹ Official website: www.rainer-schmeltzer.de/ [accessed 31/8/2014]

⁷⁰ Official website: <http://www.thomas-eiskirch.de/> [accessed 31/8/2014]

⁷¹ Official website: <http://www.reiner-priggen.de/> [accessed 31/8/2014]

⁷² Official website: sigrid-beer.de/ [accessed 31/8/2014]

⁷³ Official website: <http://wibke-brems.de/> [accessed 31/8/2014]

⁷⁴ See: <http://www.piratenfraktion-nrw.de/2014/06/kai-schmalenbach-zum-pilotvorhaben-virtuelles-kraftwerk/> [accessed 31/8/2014]

⁷⁵ URL: http://www.landtag.nrw.de/portal/WWW/Webmaster/GB_I/I.1/Ausschuesse/buchstaben.jsp [accessed 31/8/2014]

⁷⁶ URL: http://www.landtag.nrw.de/portal/WWW/Navigation_R2010/030-Parlament-und-Wahlen/015-Ausschuesse-und-Gremien/005-Ausschussuebersicht/A17/Inhalt.jsp [accessed 31/8/2014]

⁷⁷ Official website: www.henning-hoene.de/ [accessed 31/8/2014]

⁷⁸ Official website: <http://www.margret-vosseler.de/> [accessed 31/8/2014]

⁷⁹ Official website: www.gabriele-hammelrath.de/ [accessed 31/8/2014]

⁸⁰ See agenda 16/812, bullet point number eleven:
http://www.landtag.nrw.de/portal/WWW/GB_I/I.1/Tagesordnungen/WP16/800/E16-812.jsp
[accessed 31/8/2014]



projects,⁸¹ or the impact of the petition of the nationwide renewable energy law regarding the state North Rhine-Westphalia.⁸²

4.3.4 Next steps for engagement

The next step is to gain the support of end users from the state North Rhine-Westphalia for the pilots. These will be created around the policy issues mentioned above. Therefore the relevant MPs, their staff, the faction parties and especially the committees that are mentioned above will be invited to participate. Those with existing awareness of Sense4us or similar projects will prioritised for initial contact.

⁸¹ See committee log APr 16/546, issue two:

<http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/MMA16-546.pdf> [accessed 31/8/2014]

⁸² See committee log APr 16/546, issue five:

<http://www.landtag.nrw.de/portal/WWW/dokumentenarchiv/Dokument/MMA16-546.pdf> [accessed 31/8/2014]

5 Conclusions

The purpose of this deliverable was to set out the policy scenarios that the Sense4us consortium plans to use over the course of the project to drive the research, gather further feedback from end users and present the tool in the best way possible to policy-makers. Once the scenario has been confirmed, the toolkit will be populated with data, which will make it much more relevant and tangible to those that it is presented to.

The scenarios that have been detailed in this deliverable will, we believe, show the Sense4us toolkit in its best light, highlighting the myriad possibilities for policy-makers to use it in their work to develop and understand the impacts of proposed policies. In order to make a truly useful tool and to test the different research components, the policy scenarios chosen needed to address a broad, complex policy issue where policy makers face genuine difficulties when trying to bring together all the evidence and when seeking to understand future policy consequences.

Climate change, the difficulties of reducing emissions and creating a self-sustaining green energy market are certainly large, urgent and complex challenges. This was borne out by the fact that policy-makers at all levels that were surveyed or interviewed, highlighted the environment as one of the most difficult areas for them to fully understand and make effective policy on. Likewise, the economy was also seen to be a challenging area, so the economic impacts of any policy chosen as a scenario should be factored into any simulation or presentation of evidence that the tool provides.

As a result of the evidence mentioned above and analysed in D2.1, the renewal of European emissions targets and addition of renewable energy targets to take the EU to 2030, seemed a fitting choice of policy scenario. The environment is a vast political issue, so narrowing our focus to the targets for growing the renewable energy sector seemed sensible. The policy for renewable energy targets will be developed further in the near future and will affect all levels of government.

The EU is driving this policy which will need to be addressed by member states, such as the UK, who are likely, over the next few years, to draw up national plans to meet the targets. Sense4us could be used at both these levels to inform and develop policy options. Although the policy to increase the use of renewables will eventually be implemented by local administrations they are unlikely to have a primary role in developing policy at this stage. This is why it is serendipitous that the State Parliament of North Rhine-Westphalia is pursuing a similar policy at the state level in Germany.

As was set out in section 3, it is beneficial for the project to focus on one area of policy in order to demonstrate how the entire toolkit can work together on different aspects of one coherent scenario, collect a large and varied body of data to use for test purposes, and to develop the customisations necessary to provide a comprehensive and useful tool that can meet the expectations of end users in the field of renewable technology.

The renewable energy targets for 2030 and the implementation of a renewable energy strategy for North Rhine-Westphalia, provide a broad, important and necessarily complex area to use as a test case for the tool. Although the consortium will keep the choice of scenario under review and make changes to our strategy if they prove necessary in future, we feel that this policy area is a good choice to drive the research, test the tool and engage end users with the project.



6 References

6.1 Key documents – EU

European Parliament resolution on a 2030 framework for climate and energy policies - European Parliament, 2014

A Roadmap for moving to a competitive low carbon economy in 2050 – European Commission, March 2011

Renewable energy in the internal market – European Parliament, DG for Internal Policies, 2012

Indirect land use change impacts of biofuels - European Commission, public consultation, 2010

Global Trade and Environmental Impact Study of the EU Biofuels Mandate -International Food Policy Institute (IFPRI) for the Directorate General for Trade of the European Commission, 2010

Sustainable Biofuels: Addressing Indirect Land Use Change - European Parliament, DG for Internal Policies 2013

6.2 Key documents - UK

Policy summary of UK analysis on EU 2030 targets – DECC, February 2014

Costs and Benefits to EU Member States of 2030 Climate and Energy Targets – Enerdata, February 2014

A 2030 framework for climate and energy policies UK Government Response to Commission Green Paper COM (2013) 169 final – DECC, July 2013

6.3 Key documents - Germany

Promoting Renewable Energy in North Rhine-Westphalia using a virtual Power Station Pilot. This motion was published 27/05/2014 under the printing matter Drs. 16/5967

Energy Facts North Rhine-Westphalia 2013, 16 pages, version: 12/2013

Renewable Energy in North Rhine-Westphalia – Growth and Employment for Climate Protection, 48 pages, version: 02/2012

APPENDIX I

Policy-makers (UK)

Civil servants – are politically neutral officials that work independently for the governing administration of the day rather than political parties, although they will work collaboratively with ministers’ political advisors to develop policy. Civil servants are usually generalists and will move around different departments and work on different policy areas during their careers. They are the key policy-makers within government departments who develop policy at the request of the Minister.

They will bring together the evidence around a certain policy problem, speak to experts, develop policy solutions and seek to understand the implications if the policy was implemented in a certain way. The policy options will be presented to the Minister who will decide which option/s should be developed further. This process may be repeated a number of times before the Minister approves the policy.

If the policy requires primary legislation, an ad hoc team of civil servants will be temporarily recruited to form a bill team to develop the bill, which will be drafted by Parliamentary Counsel. The Bill will then be introduced and debated in Parliament.

Decision-makers (UK)

Members of Parliament (MP) – MPs are elected to represent their constituents in Parliament but also have an important role in scrutinising government policies. They carry out their scrutiny functions by asking questions of Ministers, debating, amending and voting on legislation and working in committees. MPs are supported in their scrutiny function by committee clerks and library staff (see definition of their work below).

Peers – are members of the House of Lords and have no constituents to represent. Their sole Parliamentary function is to scrutinise legislation and policy. Peers scrutinise bills in similar ways to MPs but have more time and flexibility to discuss legislation and to propose amendments. They are also supported in their role by committee clerks and library staff. The House of Lords is less politically partisan than the Commons (many do not belong to any of the political parties) and because they are appointed for life, rather than being elected every 5 years, Peers are often more independent in their views than MPs.

Parliamentary officials – both Houses of Parliament have their own independent administration staffed by a body of politically neutral officials. The officials of interest for this project are those working in the libraries and for committees that support MPs and Peers by providing them with information and evidence to inform Members’ scrutiny of legislation.

Library staff provide additional contextual information about bills, research issues as they arise and respond to specific requests for information from members and their staff.

Committee clerks provide background information to members that sit on committees, they organise inquiries, gather evidence, identify experts and write reports and recommendations for government, in collaboration with committee members.

Appendix II

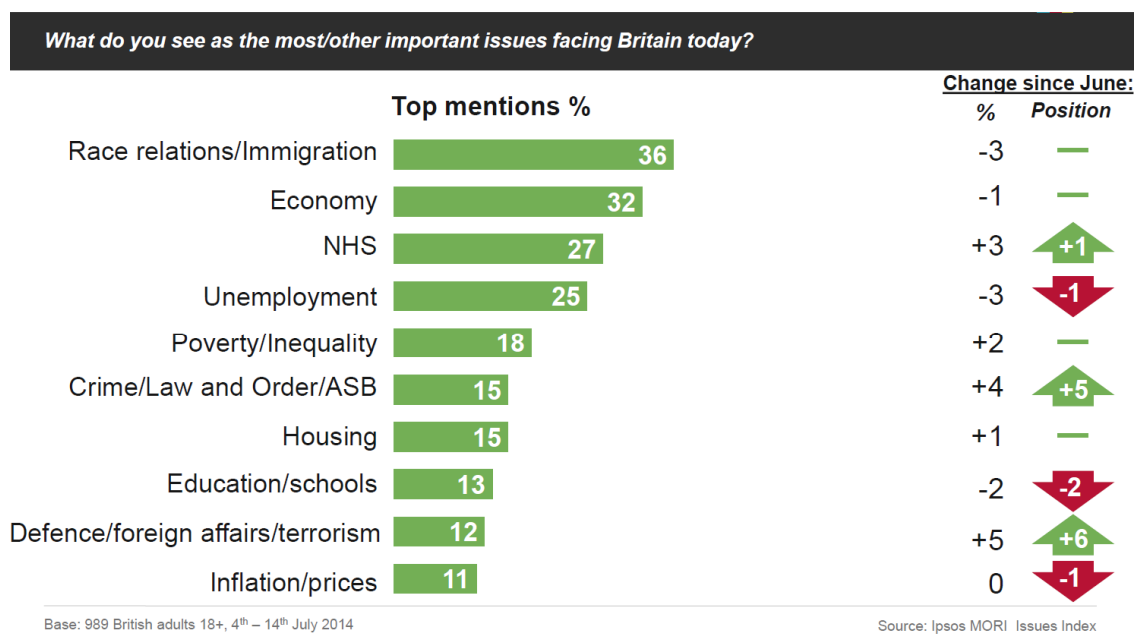


Figure 9: Most important issues facing Britain – Ipsos MORI poll

This is a question that Ipsos MORI asks each month to track public opinion on political issues – this chart is from July 2014.⁸³

⁸³ See: <http://www.ipsos-mori.com/researchpublications/researcharchive/3424/The-EconomistIpsos-MORI-Issues-Index-July-2014.aspx> [retrieved 13/08/2014]

Appendix III

Glossary

ALL PARTY PARLIAMENTARY GROUPS (APPG) – All Party Parliamentary Groups or Associate Parliamentary Groups, are informal cross-party groups that have no official status within Parliament. They are essentially run by and for Members of the House of Commons and Lords, although many APPGs involve individuals and organisations from outside Parliament in their administration and activities. Organisations which register as APPGs have to conform to rules about working in a cross-party way, and transparency in funding.

ARM’S-LENGTH BODIES – are bodies that receive government funding and often deliver or monitor public services, but are in varying degrees, independent of government. However, ministers are responsible to Parliament for their actions.

CARBON CAPTURE AND STORAGE (CCS) – this process captures Carbon Dioxide from electricity creation and industrial processes that use fossil fuels and stores it in the ground.

DGs - Directorates General of the European Parliament, which are the administrative division of the Secretariat of the institution. The Secretariat’s task is to coordinate legislative work and organise plenary sittings and meetings. It also provides technical and expert assistance to parliamentary bodies and Members of Parliament to support them in the exercise of their mandates. The European Parliament must also provide a fully multilingual service for all plenary sittings and meetings.

EFFORT SHARING DECISION (RELATED TO ETS) – The Effort Sharing Decision establishes binding annual greenhouse gas emission targets for Member States for the period 2013–2020. These targets concern emissions from most sectors not included in the EU Emissions Trading System, such as transport (except aviation and international maritime shipping), buildings, agriculture and waste. National emissions targets for 2020 have been agreed unanimously and are set on the basis of relative wealth.

EMISSIONS TRADING SCHEME (ETS) – an EU agreement under which a cap is set on the maximum GHG emissions that can be produced by factories, power plants etc. The level of the cap is reduced over time and companies are heavily fined if they exceed their allowance. Companies can receive or buy emissions allowances from other companies that are under their cap, or up to a limit, from international emissions saving projects. Spare allowances can be saved or traded. The limit on the total number of credits means the allowances have value, encourages efficiencies to be made in the cheapest way possible and encourages investment in clean low carbon technologies and innovations in the developing world.

EP COMMITTEES – European Parliament standing committees. In order to do the preparatory work for Parliament’s plenary sittings, the Members are divided up amongst a number of specialised standing committees. There are 20 parliamentary committees – a committee consists of between 25 and 71 MEPs, and has a chair, a bureau and a secretariat. The political make-up of the committees reflects that of the plenary assembly.



GREENHOUSE GASES (GHG) – gases, such as Carbon Dioxide, that absorb and emit radiation in the infrared range, contributing to the greenhouse effect and warming the earth. The burning of fossil fuels and deforestation have contributed to the levels of GHG in the atmosphere.

IPCC – Intergovernmental Panel on Climate Change. The Intergovernmental Panel on Climate Change (IPCC) is the leading international body for the assessment of climate change. It was established by the United Nations Environment Programme (UNEP) and the World Meteorological Organization (WMO) in 1988 to provide the world with a clear scientific view on the current state of knowledge in climate change and its potential environmental and socio-economic impacts.

LIFE CYCLE ASSESSMENT (LCA) – a technique to assess environmental impacts associated with all the stages of a product's life from-cradle-to-grave e.g. from raw material extraction through materials processing, manufacture, distribution, use, repair and maintenance, and disposal or recycling. LCAs can help avoid a narrow outlook on environmental concerns by:

- Compiling an inventory of relevant energy and material inputs and environmental releases;
- Evaluating the potential impacts associated with identified inputs and releases;
- Interpreting the results to help make a more informed decision.

VOID – a computer vocabulary used to link datasets.