POWERING ABERDEEN:

IN THE MAKING

ABERDEEN
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Literature review

Activities to reduce emissions and locate alternative energy supplies transcend many aspects of city development and management. It is therefore imperative that a holistic approach is taken when identifying projects that fulfil this agenda.

When developing the initial draft of Powering Aberdeen consideration was given to reviewing the many plans, policies and strategies that could align with its focus; covering topics such as transport, energy, planning, development management and health and wellbeing. A comprehensive report detailing the results of this literature review is available upon the dedicated Shaping Aberdeen webpages[1].

The literature review clearly illustrates the cross-cutting benefits Powering Aberdeen has upon a region and how many areas of city development can profit from collaborative working.

Stakeholder engagement

A number of consultants have worked with Aberdeen City Council (ACC) and relevant stakeholders to support the development of Powering Aberdeen; including Aether, Keep Scotland Beautiful (KSB), Nicki Souter Associates (NSA), Scottish Business in the Community (SBC) and the Centre for Understanding Sustainable Practice (CUSP). Initial work involved identification of key stakeholders, undertaking engagement activities, establishing a baseline year and helping gather locally available data. The latter was then utilised within modelling tools to formulate emission projections for Aberdeen, culminating in the production of an emission reduction target.

Stakeholders have been engaged throughout all stages of Powering Aberdeen development in the form of elected members surgeries, briefing notes, telephone interviews, surveys, workshops and presentations. Dedicated webpages also offer stakeholders the opportunity to view workshop outputs and reports online, through the Shaping Aberdeen platform. Continuing such activity will be essential in developing future collaborative projects and reporting on Powering Aberdeen's progress.

Stakeholder analysis and prioritisation

As part of developing Powering Aberdeen it has been essential to learn from others and encourage adoption of best practice approaches. By being a companion city within the Strategies Towards Energy Performance in Urban Planning (STEP-UP) programme free coaching support was received upon stakeholder engagement, prioritisation, assessing actions and energy flows. Gaining insights as to how Glasgow, Ghent, Gothenburg and Riga had progressed development of their Sustainable Energy Action Plans (SEAP's).

Taking this learning, a small workshop was undertaken by NSA; where a group of stakeholders were provided with lists for review and consolidated as per the following table. Copies of the lists are available within workshop one[2] and two[3] outcome reports.

[1] *http://www.aberdeencity.gov.uk/council_government/shaping_aberdeen/SustainableEnergyActionPlan.asp*
[2] *http://www.aberdeencity.gov.uk/nmsruntime/saveasdialog.asp?lID=62620&sID=25580*
[3] *http://www.aberdeencity.gov.uk/nmsruntime/saveasdialog.asp?lID=62624&sID=25580*

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Table 1 –Process of stakeholder analysis and prioritisation

List	Activity	Output
1	An original stakeholder list of 62 organisations from a previous coaching workshop delivered by STEP-UP was reviewed and notes taken of any additional organisations they would classify as stakeholders in the development of Powering Aberdeen.	List 2
2	This list comprised of 135 stakeholders or stakeholder categories. Attendees were then asked to identify the organisations which should be prioritised for engagement to inform the production of Powering Aberdeen. Priority stakeholders were defined as those who could: • Influence change; • Support the development and implementation of the key activities to produce Powering Aberdeen; and/or • Represent key themes of the Powering Aberdeen document such as electricity usage, waste, transport and energy generation.	List 3
3	Attendees were asked to review the final list to determine any omissions. No additional stakeholders were identified. The stakeholders listed were then categorised by theme to identify the key stakeholders by area of influence.	List 4
4	Stakeholders were categorised by their area of influence including Energy Consumption, Energy Generation, Transport and Waste. Attendees were given the option to highlight 'Other' themes and allocate stakeholders with influence in that area. Themes suggested by attendees included: • Funders; • Communicators; • Visioners; • Influencers; • Representatives; • Oil Companies; and • Champions. After the workshop, the frequency of 'votes' for each stakeholder was compiled to determine the collective priority placed on each. The number of times a stakeholder was identified as a key organisation by the attendees was tallied to provide a starting list for engagement.	List 5

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Stakeholder values

Key stakeholders took part in further workshops to consider Powering Aberdeen in the context of their own organisations and spheres of influence. The workshops explored stakeholders own visions, and the barriers and benefits to participating in Powering Aberdeen.

All groups felt that Powering Aberdeen should focus on practical, tangible, projects with clear emission reduction targets, clear actions and staged processes that could be delivered within realistic timeframes. These projects should take cognisance of existing initiatives and incorporate the anticipated savings.

There was also a suggestion that the focus could be on the largest emitting sectors first to achieve the greatest reductions in the shortest time. Several groups noted that transport quickly became the focus of discussions, but that the Baseline Energy and Emissions Inventory (BEEI) had indicated it was a relatively small proportion of the overall emissions from the city, and that efforts should be made to maintain focus on the largest potential reductions in the shortest time.

Data gathering

Production of a BEEI is one of the initial steps of Sustainable Energy Action Plan (SEAP) production. The BEEI quantifies the amount of emissions emitted due to energy consumption in the boundary of Aberdeen city in the baseline year, in this instance 2005. It identifies the principal man-made sources of predominantly carbon dioxide (CO_2) emissions and assists in prioritising the reduction measures.

Data has been used from Scottish Government's Second Report on Plans and Priorities (RPP2), Department of Energy and Climate Change (DECC) Updated Energy and Emissions projections: 2014 and the National Grid's Future Energy Scenarios; as well as local data sets on district heating and Combined Heat and Power (CHP) for example. The DECC data uses the Intergovernmental Panel on Climate Change (IPCC) methodology to develop UK specific emission factors with a best practice approach. As a result our BEEI is predominantly a high level overview.

The BEEI:

- uses absolute emissions[4] data which requires a reduction in an organisations overall emissions;
- considers carbon dioxide equivalent when measuring emissions; emissions of other Greenhouse gases (GHG) are included, using Global Warming Potential (GWP) to convert to CO_2e; and
- uses standard emission factors.

[4] *An absolute emission is the common measure of emissions that is used by protocols and measuring standards. It is defined as the total emission calculated in carbon dioxide equivalent.*

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Gathering data was, and continues to be, a difficult process. There are a number of reasons why our BEEI had to resort to national as opposed to local data sets. These are discussed within the bullets below.

- **Availability of data** – Aberdeen City Council (ACC) wasn't established until 1996; prior to this it covered the whole of Grampian. This impacted upon how far back usable data could be obtained and how far back actual data collection commenced. Large corporations have been mostly supportive in providing data sets; however there have been some issues over commercial confidentiality. It is recognised that ACC is a potential holder of significant sources of information, however there is acknowledgement that better recording and storage is required and resource needed for collation of this data for it to be usable.

- **Boundaries** - Whilst the geographical boundaries of the BEEI are the administrative boundaries of the local authority there are areas that need to be considered, especially trans-boundary issues such as commuting, shipping and aviation. In Aberdeen's case, the city is surrounded by Aberdeenshire. Both local authorities will need to work together to address emissions associated with these transboundary issues – encompassed hopefully under the development of a North East SEAP. It is also important to understand that Local Distribution Zones used by major energy suppliers do not conveniently coincide with city boundaries; which will affect the data sets that they provide.

- **Scope** – Determining what activities and areas are covered by any SEAP is important. Powering Aberdeen covers municipal (domestic) and non-municipal (commerce/industry) energy consumption; however consideration could be given to other direct/indirect[5] emissions such as fuel combustion and emissions related to the production of electricity. Whilst aviation and shipping are classified as out with Powering Aberdeen's scope, there impact is acknowledged within Aberdeen.

- **Format** – The format of data provided by stakeholders may not be usable, therefore it is important at being specific in how raw data should be provided and ask for information on any background assumptions used within calculations. Also, not all data sets follow the same boundaries or periods of time.

- **Quantification** – Many of the identified projects or measures may not have been quantified in terms of emissions savings as this hasn't been a requirement in the past and the skills to assess levels of emissions reduction might be limited. Therefore quantification can be a difficult exercise to undertake. Some projects or measures may not have been included as time to determine this information may be prohibitive.

- **Good contacts:** knowing whom to speak to has been challenging. There is a need to establish good contacts within all organisations and at the relevant level.

In addition to the inventory of the baseline year, emission inventories will be compiled in the later years to monitor progress towards Powering Aberdeen's target. Such an emission inventory is called a Monitoring Energy and Emission Inventory (MEEI[6]). Using national data sets, emissions for 2005 are estimated as 1,734 $kTCO_2e$ for the baseline year. For 2012 they are estimated as 1,431 $kTCO_2e$ for the monitoring year.

[5] *Direct emissions are from sources that are owned or controlled by the reporting entity. Indirect emissions are those produced from consumption of purchased electricity, heat or steam, but occur at sources owned or controlled by another entity.*
[6] *http://www.aberdeencity.gov.uk/nmsruntime/saveasdialog.asp?lID=64520&sID=25580*

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Scenario modelling Background

The data from the BEEI was utilised in the development of future GHG emissions scenarios for the city based on national energy projections applied at a local level, combined with initial estimates of the impacts of local measures. The scenarios have been used in order to inform future GHG emissions in a 'Business as Usual' (BAU) scenario and 'With Intervention' scenario (i.e. with a SEAP) as well as estimate potential uncertainty in these projections. This approach has allowed opportunities for energy efficiency, low carbon energy generation and other mitigation measures to be identified; enabling estimation of the potential emission reductions from the various contributing sectors, with the goal of identifying potential energy and GHG reduction targets for ***Powering Aberdeen***.

Stakeholder workshops were held in Aberdeen during January 2015. The workshops were designed to present draft BAU and 'With Intervention' scenarios for Aberdeen, based on the national energy and GHG emission projections. These projections were then considered in the context of Aberdeen. The underlying assumptions were reviewed with stakeholders and sources of more relevant, local data and information were identified. This process was undertaken during three separate workshops, each of which was attended by different sets of stakeholders. The workshops were designated as follows:

- Workshop 1: Strategic overview of inventories and scenarios: drivers and opportunities
- Workshop 2: Sustainable transport scenarios
- Workshop 3: Built environment and low carbon energy supply scenarios

Delegates were also asked to identify local actions, infrastructure and drivers that could impact upon energy use, generation and GHG emissions for Aberdeen in the future based on potential impact (in terms of GHG emissions) and level of certainty of manifestation.

The initial projections for Aberdeen City were adjusted to be consistent with local estimates of economic and population growth and expectations for actions to reduce emissions.

Applying the best fitting elements of RPP2 scenarios in terms of economic and population growth provided a 'best estimate' of the level of emissions with associated uncertainty. The resulting scenario suggests that for the BAU scenario, in the absence of any action on climate change, emissions from Aberdeen could increase by about 5% by 2027.

The 'With Intervention' scenario was adjusted based on outcomes from the Stakeholder Workshops to include those policies and actions that were considered most relevant in Aberdeen City. Overall savings in the 'With intervention' scenario can be estimated by subtracting the savings estimated from national policy and local projects and policies from the BAU scenario. This translates to a saving between 2012 and 2027 of about 38%, which when added to the saving achieved between 2005 and 2012, results in potential savings of 49% by 2027, based on a 2005 baseline.

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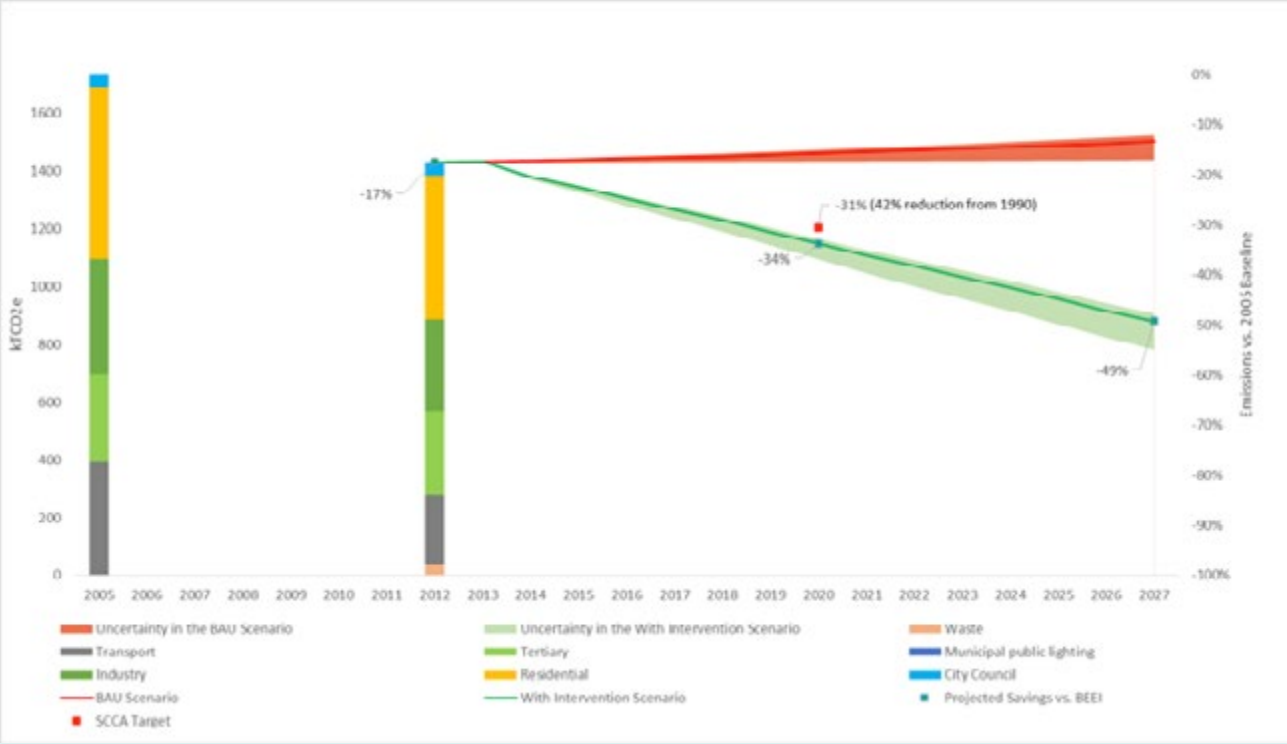
Scope of Analysis

The basis for the estimates of energy consumption and GHG emissions in Aberdeen city is taken from the DECC 'Sub-national total final energy consumption data[7]' which provides data from 2005 to 2012 at the time of writing[8]. This dataset provides energy consumption data for the geographical area within the Aberdeen city jurisdiction from which the GHG emissions can be estimated. ACC have selected 2005 as the 'baseline year' (the closest year to the suggested year, 1990, for which local data is available), against which ***Powering Aberdeen's*** target can be set. In order to monitor the retrospective progress which has been made to date, the energy (and GHG emissions) for 2012 have also been analysed.

The scenarios do not include a detailed analysis of specific policies and measures, but a high-level overview of those which could impact upon energy use, generation and GHG emissions in the city. The scenarios presented form a basis for further work by Aberdeen city stakeholders in creating quantified actions and measures which will enable the achievement of Powering Aberdeen's objectives; and development of the necessary monitoring mechanisms to establish progress against the target.

Figure 1 - BEEI (2005), MEEI (2012) and BAU and 'With Intervention' emissions scenarios with associated uncertainty for Aberdeen City. Percentages provided are savings in emissions compared with the 2005 BEEI.



Further information on the scenario modelling process is available within the Aberdeen City Future Energy and Emissions scenario report[9].

[7] *Emissions data is calculated using the DECC Sub-national total final energy consumption data (https://www.gov.uk/government/collections/total-final-energy-consumption-at-sub-national-level).*
[8] *This data is available on a 2 year time lag, the time taken to compile and process the data.*
[9] *http://www.aberdeencity.gov.uk/nmsruntime/saveasdialog.asp?lID=64524&sID=25580*

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