

# Discussing national energy supply and demand

The aim of this exercise, which needs to be carried out in the early stages of your project, is to help people gain a better understanding of the UK's current and future energy needs.

This exercise uses the Department of Energy and Climate Change's (DECC) 2050 Pathways Calculator – <http://2050-calculator-tool.decc.gov.uk/>

Due to the complexity of the tool, it's assumed that participants already have a certain level of background knowledge.

Therefore it may be the sort of exercise that is better suited to council staff, planners, parish councillors or just the core members of a community group. Running the exercise in a wider public setting may prove difficult and unmanageable, unless the facilitator has a strong knowledge of the tool.

Allow **60 minutes** to complete this exercise

## Materials needed

To run this exercise you'll need a laptop or a desktop computer for every group, each with an internet connection. As participants will be required to gather

around a computer screen for much of the time, you may be limited to the size of group or groups that you can accommodate.

If you're running this exercise for a single group you may want to use a projector so that all the participants can view the screen easily.

It would also be helpful for the facilitator to print off the notes at the end of this exercise which cover some of the points raised in the 'Help' section.

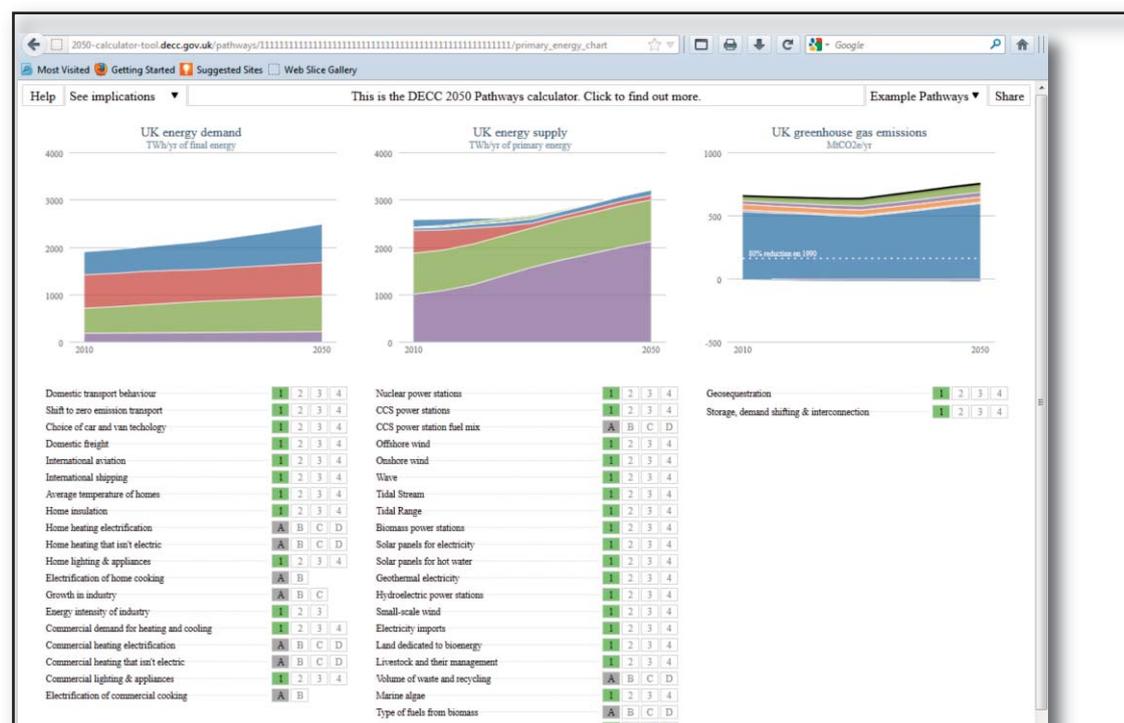
## Arranging the room

Arrange the room in such a way that everyone is able to see a computer screen for this first part of the exercise.

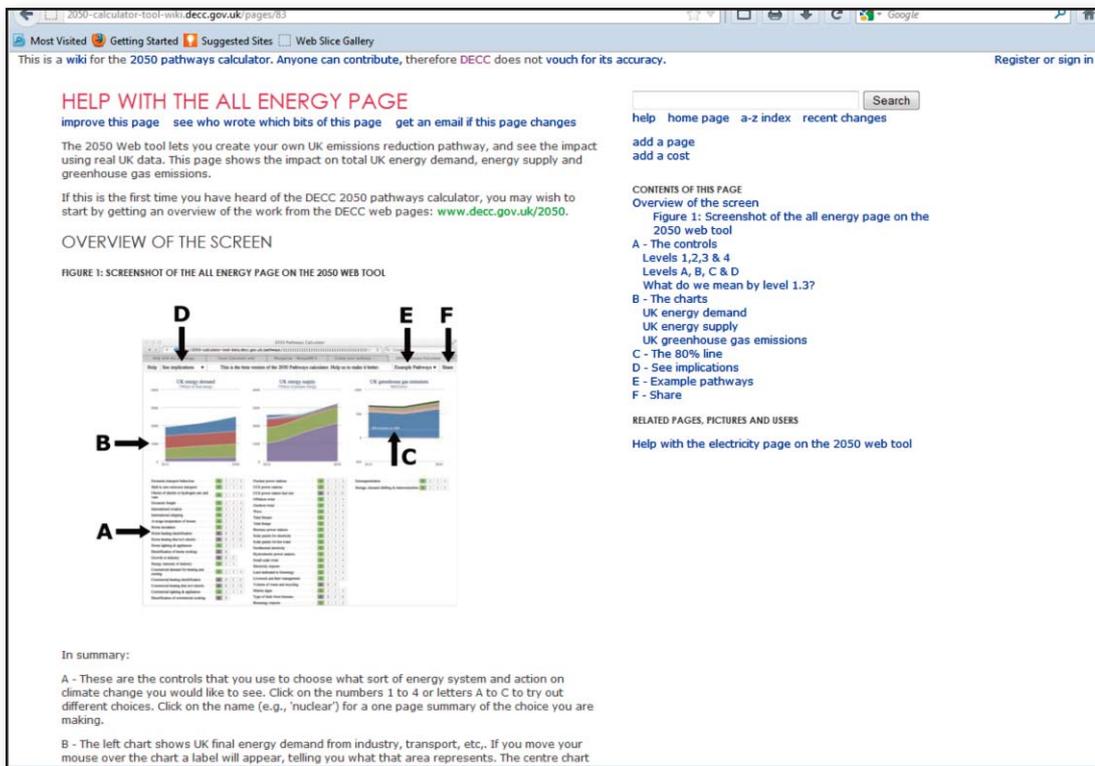
## People needed to run the exercise

One person is needed to lead the session. Ideally you would have a minimum of six people taking part in the exercise, split into pairs or groups of three.

It is possible to run the exercise as one group, though with more people it will require close facilitation to keep the group on course and keep the exercise on time.



Left: the home page of the 2050 Pathways Calculator



Left: the help page of the 2050 Pathways Calculator

## Full instructions for running the exercise

*Preparation: gathering the information you'll need to run this exercise*

It's very important that the facilitator takes some time in advance of running this exercise to become familiar with the 2050 Pathways Calculator. Each option in the tool has a help window that explains in further detail the selections and the assumptions that those choices are based on.

The facilitator should look through all of these before they consider running the exercise. The facilitator should also read the notes at the end of this chapter before beginning, too.

There is also a help section in the top left of the calculator screen and the facilitator should read this thoroughly before beginning. If possible the facilitator should test run the calculator in the venue to make sure that it will run smoothly on the internet connection provided.

*Stage 1) Explaining the need to cut carbon emissions (10 minutes)*

Begin by explaining to participants that the UK is currently committed to cutting its carbon emissions by 80% by 2050. In order to help the public engage in the debate over how this can be achieved, DECC developed the 2050 Pathways Calculator.

As well as using the 2050 Pathways Calculator it will be important to let the groups know that this is going to be an exercise to encourage discussion about how potential future national energy policy could affect their local community and what (if any) opportunities they could see.

*Stage 2) Carrying out the exercise (30 minutes)*

Firstly, demonstrate how the tool works by selecting different shifts in energy production and demand, and seeing how this changes the graphs above those selections that illustrate demand, supply and overall CO<sub>2</sub> emissions. If participants don't understand what an option means or represents then they can click on the heading and a help window will automatically open in another browser tab.

Tell them that, working in groups, they are going to attempt to meet the UK target for CO<sub>2</sub> reductions by 2050, but they will have to attempt to achieve an 80% reduction by setting no energy demand over 3 or C (B is allowed when just a choice between A and B).

The reason behind these restrictions is to demonstrate the scale and mix of energy supply that will be required in 2050 in order to meet the 80% reduction.

Let the groups know that they have 30 minutes to try and reach the target, but if they cannot hit the 80% reduction, they shouldn't worry as this is something that can be discussed when the groups reconvene.

### Stage 3) Comparing and contrasting different outcomes (10 minutes)

Bring the groups back together to discuss the results of their own pathways. Even if they have not managed to achieve the target of 80%, they should still be able to feed back some helpful comments to the group to initiate discussion.

The facilitator should consider using the following questions to help generate discussion:

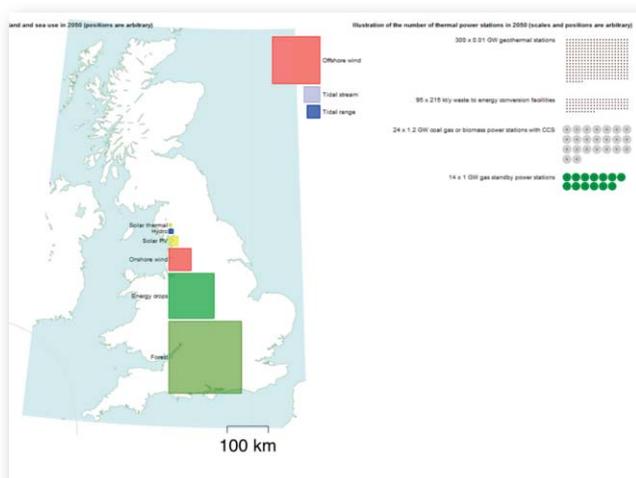
- What did they find difficult about the exercise?
- What did they find surprising about the exercise?
- How realistic/achievable did they believe their choices to be for both the demand and supply?

### Stage 4) Looking at the 'area' implications (10 minutes)

Show each group that there is the option within the tool to look at what their choices mean in terms of implications for their chosen mix of energy production. One of the options available is 'Area' and ask each of the groups to select this option.

The image above the selections that the group has made should now be a map of the UK that shows the number of thermal power stations that would be needed based on the options that they have selected. Although this is not to scale, it should give the groups an idea as to how many power stations would be needed to be built across the country. There is also a colour scale representation of how much land and sea would be required for their renewable options.

This doesn't just cover area required for technologies like wind, but it also demonstrates what would be required in terms of wood resource for forest crops and energy crops. In the bottom left corner, any imported energy resources will be shown.



Before moving onto the discussion for this section, open up the calculator in two additional tabs and use the example pathways menu in the top right hand corner of the tool. This will allow you to choose different pre-set scenarios that have been designed to reach an 80% reduction in a variety of ways. You should pick the 'Higher renewables, more energy efficiency' and 'Higher nuclear, less energy efficiency' and get the group to look at the area implications for both of these as well.

Ask the groups to consider the following questions for discussion:

- Did they find anything surprising about the area implications of their scenario?
- How did this compare to the two other example pathway scenarios?
- How can the resources they have available locally help their community to contribute to national energy production targets?
- What challenges do they see locally considering how the national picture could look based on their scenario and the two examples?

### Closing comments

This exercise should give the groups plenty to talk about, but if they want to explore the Pathways tool further then they may wish to look at the other example pathways that are available to view from the top right hand corner of the home page.

From here they can see how organisations such as Friends of the Earth and the Campaign to Protect Rural England have suggested reaching the 80% CO<sub>2</sub> reduction targets.

There is also the facility to share their chosen pathway, which may be something that community groups would want to do with other local groups. Alternatively, it could be made available for other members in their wider group to view from their own website.

As a follow-up exercise the facilitator may want to suggest looking at the PlanLoCaL exercise, 'Setting the scene: discussing our community's energy use', which will give a more local perspective on energy demand and help to shape any potential ideas for a community renewable energy project.

Left: the area implications page of the Calculator

# Notes for the facilitator

DECC has based its analysis for the 2050 Pathways Calculator on 2007 data. So for each chart the current baseline for demand, supply and emissions is modelled on 2007 data. It's anticipated that DECC will update the analysis for the calculator soon.

## Energy demand

As mentioned in the 'Help' section of the 2050 tool, there are three main assumptions that are taken when considering energy demand:

1. That the UK population grows by 25% to 77 million by 2050
2. That the number of households grows faster, to increase by 50% to 40 million by 2050
3. That UK GDP grows even faster, more than doubling to £3 trillion by 2050

## Energy supply

If the participants make choices that result in a shortfall of primary energy supply to the chosen demand then the model assumes that sufficient gas, oil and coal will be imported to cover any shortfall.

If those choices result in too few power stations to meet electricity demand then the model assumes natural gas power stations will be built.

## Greenhouse gas emissions

The right hand chart shows the following components that go into the analysis of greenhouse gas emissions:

- Fuel combustion (the burning of fuel in businesses, vehicles, industry and power stations)
- Non-CO<sub>2</sub> greenhouse gases (methane etc) in CO<sub>2</sub> equivalents
- Emissions that don't relate to energy production, such as from industrial processes, waste and agriculture
- A share of emissions from international aviation and shipping (even though these are not part of the UK emissions target)

It does not include emissions accounted for by goods that the UK imports, but it does include emissions accounted for by goods that the UK exports.

There is also a representation of 'negative emissions' on the greenhouse gas emissions chart. The amount of this is shown below the zero line, and also brings down the black 'total emissions' line by the equivalent amount. The analysis has chosen to:

- Count bio-energy as generating CO<sub>2</sub> emissions when burnt and then to assume that an exactly equivalent amount was removed from the atmosphere when the plant was grown
- Count carbon capture and storage as generating CO<sub>2</sub> emissions for the full amount of fuel burnt, and then assuming an appropriate amount of negative emissions to offset the proportion that will be captured and stored