



Energy research Centre of the Netherlands

Public perceptions of low carbon energy technologies

Results from a Dutch large group workshop

S. Brunsting

B. van Bree

C.F.J. Feenstra

M. Hekkenberg

SUPPORTED BY



GLOBAL
CCS
INSTITUTE

ECN-E--11-044

JULY 2011

Acknowledgement

This report is part of the large group process project performed by ECN commissioned by the Commonwealth Scientific and Industrial Organisation (CSIRO). This project is filed at ECN under project number 5.1246.

The project is funded by the Global CCS Institute (the Institute). CSIRO has been contracted by the Institute to manage a number of studies, including running three international large group processes (one each in Canada; the Netherlands, and Scotland) to compare results with processes run in Australia.

For more details about the Institute see <http://www.globalccsinstitute.com/>.

ECN acknowledges the financial and other support provided by the Institute and CSIRO. ECN also acknowledges the informal but critical role played by international research partners and their individual contributions to the research being completed for the Institute.

The authors thank the group facilitators for their contributions to the project: Mariëtte Pol, Joost Gerdes, Wouter Wetzels, Stefan Bakker, Koen Schoots, Casper Tigchelaar, Joost van Stralen, Marjolein de Best-Waldhober, and Martine Uyterlinde (all ECN). The authors further thank Motivaction for recruiting the study participants, presenters Ton van Dril (ECN) and Marc Kombrink (ROAD project) for their presentations during the workshop, the hosts and caterers of the Jaarbeurs Utrecht for their services during the workshop and lead facilitator Victor Coenen for facilitating the workshop.

The authors thank Marjolein de Best-Waldhober, Mariëtte Pol, Marc Londo and Remko Ybema (all ECN) for reviewing or commenting on earlier drafts of this report.

Abstract

This report describes the outcomes of a large group workshop held in Utrecht, the Netherlands on 21 May 2011. The workshop aims to learn about Dutch citizens' perspectives on climate change and low emission energy technologies and how these perspectives may change after receiving and discussing objective information. This report presents participants' environmental profile, stated beliefs, knowledge and attitudes, support for different energy technologies, and environmental behaviours and intentions, derived from questionnaire answers and observations during the day. The report also presents observed changes on the above over the course of the workshop. Whereas the report provides some conclusions and inferences throughout its sections, the focus of the report is on presenting the observations. No overall conclusions are drawn.

Disclaimer

The views expressed in this report are not necessarily the views of the Global CCS Institute (the Institute), and the Institute does not accept responsibility for any information or advice contained therein.

Contents

List of tables	5
List of figures	5
1. Introduction	9
2. Methodology	11
2.1 Recruitment	11
2.2 Process	11
2.3 Information materials	14
2.4 Data collection and analysis	14
2.4.1 Quantitative data collection	14
2.4.2 Qualitative data collection	15
2.5 Differences between methodology applied in Australia and in the Netherlands	15
3. Participant characteristics	17
3.1 Age and gender	17
3.2 Education	17
3.3 Employment	18
3.4 Household structure	18
3.5 Income	19
4. Results: environmental profile	21
4.1 Pro-environmental beliefs	21
4.2 Pro-environmental behaviours	21
5. Results: knowledge and attitudes	23
5.1 Knowledge about climate change and related issues	23
5.2 Knowledge of energy sources and related technologies	24
5.3 Attitudes toward climate change and related issues	25
5.3.1 Climate change	26
5.3.2 Electricity and climate change	27
5.3.3 Doing more to reduce emissions	27
5.3.4 Increasing the price of electricity	27
5.4 Attitudes toward energy sources	28
5.4.1 Solar and wind	28
5.4.2 Wave/tidal, hydro-electric, and geothermal	29
5.4.3 Coal and oil	31
5.4.4 Nuclear	31
5.4.5 Carbon capture and storage (CCS)	32
5.4.6 Biofuels	33
5.4.7 Natural gas	34
5.5 Energy technology preferences	35
6. Energy related behaviours and intentions	38
6.1 Willingness to pay more for electricity	38
6.2 Intended behaviours as a result of the workshop	39
7. Communication	40
7.1 Trust in information sources	40
8. Key issues arising from discussions	41
8.1 Climate change and related topics	41
8.2 Energy resources and accompanying technologies	41
8.3 Willingness to pay more	42

8.4	Current behaviour related to energy saving and green energy	42
8.5	Interest in the topic	43
9.	Key messages from the process	44
	Literature	47
Appendix A	Pre-workshop, process and post-workshop questionnaires	48
Appendix B	Statistical tables	74
Appendix C	Presentation slides	78

List of tables

Table 2.1	<i>Workshop programme</i>	12
Table 3.1	<i>Age and gender of workshop participants (compared with Dutch population)</i>	17
Table 3.2	<i>Education level</i>	17
Table 3.3	<i>Employment status</i>	18
Table 3.4	<i>Occupation classes</i>	18
Table 3.5	<i>Household type</i>	19
Table 3.6	<i>Household size</i>	19
Table 3.7	<i>Household incomes</i>	19
Table 5.1	<i>Ranking of average technology funding priority (pre- and post-workshop)</i>	35
Table 6.1	<i>Willingness to pay more for electricity</i>	38
Table 9.1	<i>Key messages on Climate change</i>	44
Table 9.2	<i>Key messages on Energy technologies</i>	45
Table 9.3	<i>Key messages on own behaviour</i>	46
Table B.1	<i>Environmental beliefs</i>	74
Table B.2	<i>Environmental behaviours</i>	74
Table B.3	<i>Knowledge of energy and the environment</i>	74
Table B.4	<i>Mean changes in knowledge of climate change and related issues</i>	75
Table B.5	<i>Mean changes in knowledge of energy sources and related technologies</i>	75
Table B.6	<i>Mean changes in attitude toward climate change and related issues</i>	76
Table B.7	<i>Mean changes in attitude to energy sources and related technologies</i>	76
Table B.8	<i>Changes in the mean priority of preferred energy technology</i>	76
Table B.9	<i>Intended behaviour as a result of the workshop</i>	77
Table B.10	<i>Mean trust in information sources</i>	77

List of figures

Figure 2.1	<i>Participant asking a question following the plenary presentations</i>	13
Figure 2.2	<i>Summary of key message by facilitators</i>	14
Figure 4.1	<i>Environmental behaviours (percentage of participants who circled 'yes')</i>	22
Figure 5.1	<i>Mean knowledge of climate change and related issues (pre- vs post-workshop)</i>	24
Figure 5.2	<i>Mean changes in knowledge of energy sources and related technology (pre- vs post-workshop)</i>	25
Figure 5.3	<i>Mean changes in attitude toward climate change and related issues (pre- vs post-workshop)</i>	26
Figure 5.4	<i>Mean changes in attitudes to energy sources and related technologies (pre- vs post-workshop)</i>	28
Figure 5.5	<i>Change in response for support for solar energy (pre- vs post-workshop)</i>	29
Figure 5.6	<i>Change in response for support for wind energy (pre- vs post-workshop)</i>	29
Figure 5.7	<i>Change in response for support for hydro-electric energy (pre- vs post-workshop)</i>	30
Figure 5.8	<i>Change in response for support for wave/tidal energy (pre- vs post-workshop)</i>	30
Figure 5.9	<i>Change in response for support for oil (pre- vs post-workshop)</i>	31
Figure 5.10	<i>Change in response for support for nuclear energy (pre- vs post-workshop)</i>	32
Figure 5.11	<i>Change in response for support for CCS (pre- vs post-workshop)</i>	33
Figure 5.12	<i>Change in response for support for biofuels (pre- vs post-workshop)</i>	34
Figure 5.13	<i>Change in response for support for natural gas (pre- vs post-workshop)</i>	35

Figure 5.14	<i>Changes in priority of the mean preferred energy technology (pre- vs post-workshop)</i>	36
Figure 6.1	<i>Percentage of participants that indicated to be willing ('yes') or non-willing ('no') to pay more for electricity if it reduced greenhouse gas emission</i>	38
Figure 6.2	<i>Intended behaviour changes as a result of the workshop (intentions measured as (1) strongly disagree, (4) unsure), (7) strongly agree – note that the number of people in the pre-no and pre-yes groups vary per question)</i>	39
Figure 7.1	<i>Trust in information sources (Trust measured as (1) no trust, (4) unsure, (7) much trust)</i>	40

Summary

This report describes the outcomes of a large group workshop held in Utrecht, the Netherlands on 21 May 2011. The workshop aims to learn about Dutch citizens' perspectives on climate change and low emission energy technologies. This report presents the participants' environmental profile, stated beliefs, knowledge and attitudes, support for different energy technologies and the participants' environmental behaviours and intentions, both from questionnaire answers and observations during the day. The report also presents observed changes therein over the course of the workshop. Whereas throughout the report we provide some conclusions and inferences from the observations made, the focus of the report is on presenting results.

The study, commissioned by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia, replicates a number of large group workshops held in Australia by CSIRO. To enable comparison of the outcomes, the study's methodological set up and analysis as well as the structure of the present report resembles the Large Group Process approach developed by CSIRO as much as possible.

The workshop consisted of two parts. In the first part, two energy experts presented current best available knowledge on climate change, energy use and energy technologies. In the second part, the participants had to discuss about these issues in small groups. Before, between and after these two parts the participants completed a questionnaire on their knowledge about and attitudes towards climate change and low emission energy technologies. The workshop participants (n=111) were recruited to form a representative sample of the Dutch population in age, gender and education level.

The *environmental profile* of the participants shows a high engagement towards environmental behaviour. Over 80% of the participants indicated to engage in conservation of electricity at home, garbage recycling, use of energy efficient light bulbs, considering energy efficiency rating when purchasing white goods and bringing one's own bags when shopping.

The results show that the participants on average have relatively little *knowledge* on climate change, energy use and energy technologies. A knowledge-test resulted in more incorrect than correct answers. However, participants' self-reported knowledge on climate change, energy use and energy technologies increased significantly during the workshop. For example, before the workshop, almost 60% of participants agreed that the production of electricity is a major contributor to greenhouse gas emissions. During the workshop, this share increased to almost 80%.

In the deliberation sessions throughout the day, most participants expressed that climate change is an important issue and support statements that more should be done to address it. Significant changes were observed over the course of the workshop, indicating less support for promoting energy conservation in the home, and more support for reducing greenhouse gas emissions by industry and governments. Support for the statement that this can be achieved by raising the *price of electricity* significantly increased over the course of the workshop, but on average support for this statement remained very weak.

The results on *support for energy technologies*, show considerable variation between technologies. Generally, support for renewable energy technologies is larger than support for non-renewable technologies. Solar and wind energy received the highest levels of support both before and after the workshop. The least support is expressed for coal technologies, followed by nuclear, oil, and CCS. On average the support for coal, coal seam gas, nuclear, oil, natural gas, geothermal and wind increased during the workshop, while the support for CCS, biofuels, wave/tidal, hydro-electric power and solar decreased.

With regard to *energy related behaviour and intentions*, 43% of the participants indicated to be willing to pay more for electricity if that would reduce greenhouse gasses. However, as stated above, most people doubt if paying more would indeed result in lower greenhouse gas emissions. The majority of these is willing to pay up to 20 euro extra per quarter. Participants have a relatively strong intention to show environmental friendly behaviour, but the high mean score for ‘continuing current behaviour, because I already do most of the above [environmental behaviours, red.]’, suggests little room for change on the behaviour.

Results on communication show that participants express varying and fairly low mean levels of trust in 15 nominated sources of information. Research institutes, academic articles and family and friends were rated most trustworthy, while social network sites and industry were least trusted as information sources.

The above mentioned outcomes of the questionnaires are in line with the opinions participants expressed verbally in the small group discussions. Throughout the report, quotes from the small group discussions are provided to demonstrate the correspondence between quantitative and qualitative findings.

1. Introduction

This document reports on the outcomes of a large group workshop that was held on 21 May 2011 in Utrecht, the Netherlands. The study, commissioned by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) in Australia, aims to replicate a number of large group workshops held in Australia by CSIRO.

These workshops are part of a wider research program exploring the likely acceptance of various low emission energy technologies among the Australian public, and to identify likely pathways to a low emissions energy future for the nation. To enable cross-country comparison of results, the present study's methodological set up and analysis as well as the structure of the report resembles the approach followed by CSIRO as much as possible.

Considerable evidence points to human activity as one of the sources of climate change (Pachauri & Reisinger, 2007). Mitigating climate change is one of the greatest challenges that humankind faces nowadays. Low emission energy technologies are key in combating climate change. Yet, large-scale implementation of these technologies can only be successful if they meet societal acceptance. Creating or changing societal acceptance of an issue requires knowledge of the present degree of social acceptance or lack thereof, underlying reasons. An important indicator of societal acceptance of the implementation of low emission energy technologies is the perspective of citizens about climate change and energy technologies.

A well established approach to assess citizens' perspectives is to sample participants in focus groups of 8-10 people. In order to improve the efficiency of this approach, CSIRO has developed a methodology for workshops that enable participation of approximately 100 people while maintaining the characteristics and benefits of smaller groups. The method is therefore entitled 'Large Group Process' (Ashworth et al, 2009).

Apart from collecting valid and reliable data on public perspectives about climate change and energy technologies, the Large Group Process also aims to promote informed judgments about these options. Central to achieving such judgments is engendering trust in the information sources used in the workshop process. Discussion groups have the potential to change people's attitudes toward, and acceptance of, an issue, but, this effect strongly depends on the perceived independence and trustworthiness of those providing the information (Moon & Balasubramanian, 2003; Slovic, 1993; Marks et al, 2004). Therefore, this method pays particular attention to ensuring the objectivity of information provided to participants and to demonstrate that opinions on the topics diverge, with the aim of making people feel comfortable with sharing any thought and opinion on their mind. For the same reason, and to avoid influencing the research outcomes, facilitators should be trained in leading a discussion without involving themselves.

CSIRO has conducted such workshops successfully in four Australian cities in 2009 and one in 2011, documenting the perspective of the Australian public towards climate change and low emission technologies as well as demonstrating the effectiveness of the large group process. To compare perspectives of citizens in different countries and to further test the effectiveness of the Large Group Process, CSIRO has commissioned the Energy research Centre of the Netherlands (ECN) to replicate this method in a workshop in the Netherlands. In the same period, CSIRO also commissioned a similar workshop in Canada.

ECN is a research institute that develops knowledge and technologies for a sustainable energy system. ECN has expertise in a wide range of issues related to energy technologies and the introduction thereof. Next to technically oriented studies, scenario studies and policy and

economic analyses, ECN's unit Policy Studies has been involved in various studies related to social acceptance of energy technologies.¹. Because the various tasks in preparation and execution of a Large Group Process require expertise in the social sciences as well as understanding of energy technologies, ECN Policy Studies is well positioned to execute these tasks.

This report will first describe the methods employed (chapter 2). Next, the characteristics (chapter 3) and environmental beliefs (chapter 4) of participants in the Large Group Process are summarised. Chapter 5 then presents the knowledge and attitudes of the participants, highlighting the differences before and after the provision of information and the small group debate. Behaviour and intentions of the participants, and whether the participants intend to change their behaviour after the workshop are described in chapter 6. Chapter 7 summarises the extent to which participants trust the provided information on climate change as well as their preferences regarding communication on climate change. Finally, the last two chapters discuss the key issues (chapter 8) and messages (chapter 9) that resulted from the workshop.

¹ Including the national project CATO1, CATO2, European research projects Sitechar, NearCO₂, ChangingBehaviour, ACCSEPT, CreateAcceptance, and several projects on a global scale including an international comparison of communication and engagement in CCS projects. More information about these projects, the work of the Unit Policy Studies, or ECN in general can be found at www.ecn.nl/ps.

2. Methodology

To enable comparison with the Australian workshops, the Dutch Large Group Process resembles the methodology used in Australia as much as possible. Changes to the methodology have been restricted to adaptations that were necessary to fit the Dutch context. Details of the applied methodology are described in the following sections. Differences between the methodology applied in Australia and in the Netherlands are described in Section 2.5.

2.1 Recruitment

A Dutch market research agency was hired to recruit ~100 individuals of over 18 years old to obtain a sample representative of the Dutch population with respect to age, sex, and education. To enhance the probability of participation, only individuals within an hour's travel time of the city of Utrecht were invited.

Using e-mail, the agency used its online respondents panel to approach a selection of respondents fulfilling the criteria for participation. The invitation asked respondents if they were interested a discussion about a 'current topic' for one full day. The invitation explained that participants would not only be asked to discuss this topic and fill in questionnaires but that they would also receive several expert presentations on the topic which would make the day not only fun, but also informative.

The topic, aim, and name of the organising institution (ECN) were not communicated in the invitation, in order to prevent selection bias with regard to attitudes towards energy, climate change or societal relevant issues. A total of 120 people were recruited to ensure attendance of at least 100 participants. Individuals who attended the full day were offered an incentive of 100 euro. A total of 112 individuals attended the workshop, of which 111 completed the questionnaires and were included in the analyses.

2.2 Process

The workshop was held on Saturday, May 21st 2011, between 9.30am and 5pm. The location, the Jaarbeurs in Utrecht, is a well known conference location situated in the centre of the country. The workshop was split into plenary and breakout sessions. Plenary sessions were chaired by a lead facilitator, who tended to the overall running of the workshop. In the breakout sessions, discussions were held in groups of 9-10 participants. Discussions were moderated by facilitators, who introduced and encouraged discussion, attended to the group process, took notes, and summarised the discussion. At the end of the day, the facilitators extracted the key messages and issues from the group discussions.

The lead facilitator was recruited from an external agency. The table facilitators were recruited from ECN Policy Studies staff. In a 2-hour preparatory session prior to the workshop, their role in the workshop was explained. Key points addressed in the instruction were:

- Explanation of research background, purpose, and method.
- How to introduce oneself to the group, i.e. as personnel for the day and not as energy experts. When asked about it by participants the facilitators have been honest about their employment at ECN, but have also explained that they were not experts in the topics central to the workshop but had 'another area of expertise'.
- Techniques for leading a discussion, a.o. the importance of being neutral and refraining from expressing own opinions as well as basic group dynamics and how to deal with them.
- Provision of question prompts to use in case the discussions would stall.

- Provision of a template to facilitate note-taking and summarising group feedback.

The workshop programme is summarised in Table 2.1 and is discussed step-by-step below.

Table 2.1 *Workshop programme*

Programme Large Group Process 21 May 2011, Jaarbeurs, Utrecht			
1	9:30	10:00	Registration and coffee
2	10:00	10:10	Welcome
3	10:10	10:20	Round table introductions
4	10:20	10:40	Questionnaire #1 – Pre-workshop
5	10:40	10:45	Digivote warm up
6	10:45	11:00	Digivote - Round 1
7	11:00	11:15	Interactive Discussion – awareness, state of play
8	11:15	11:30	MORNING TEA
9	11:30	11:50	Presentation Part 1 Climate change – Ton van Dril
10	11:50	12:10	Presentation Part 2 Energy Technologies – Ton van Dril
11	12:10	12:30	Presentation Part 3 CCS Local Project – Marc Kombrink
12	12:30	12:50	Reactions and points of clarification
13	12:50	13:00	Questionnaire #2 – Process
14	13:00	13:30	LUNCH
15	13:30	14:30	Deliberation
16	14:30	15:10	AFTERNOON TEA
17	15:10	16:00	Voicing concerns & key messages
18	16:00	16:20	Questionnaire #3 – Post-workshop
19	16:20	16:35	Digivote – Round 2
20	16:35	16:45	Wind up
21	16:45	17:00	FINISH

After registration and coffee (1) the lead facilitator opened the workshop, outlining the context and the focus of the day (2). Next, participants held a round of introductions in their breakout discussion groups (3). Right after this, and before being exposed to any information on the

topics, participants were administered a questionnaire to assess current knowledge and attitudes toward climate change and low emission technologies as well as demographic data (4). The participants were then introduced to the Digivote system (5). This system allows participants to issue a vote and then visualises the result of the voting process. After a warm-up round to make the participants familiar with this technology, the system was used to assess the group attitudes toward climate change and low emission technologies (6). Individuals thus immediately received feedback on the distribution of attitudes in the group. The aim of this voting process was twofold (Ashworth et al, 2009):

- 1) To provide feedback to the group about the range of views in the room.
- 2) To build the group identity of the participants as members of the larger group.

The Digivote process was followed by a short interactive discussion in a breakout session (7). This session allowed participants to exchange their ('pre-workshop') views on climate change and low emission technologies. To facilitate data analysis, this breakout session was audio taped per table. The morning part was concluded with a tea break (8).

After the morning tea, participants were provided with information in a series of three presentations (9-11), each delivered by an expert on the topic. The three presentations dealt with climate change, energy technologies, and CCS, respectively. After the presentations, the participants were given the opportunity to ask questions (12), after which they filled in a second questionnaire to assess their perceptions of the group, the experts and the information provided. (13). The morning session was ended with a short lunch break (14).



Figure 2.1 *Participant asking a question following the plenary presentations*

After lunch, the participants deliberated on the information they had received in small group breakout sessions moderated by the table facilitators (15). Participants were asked to share their reactions to the information, their concerns and preferences for the range of energy options presented, and also to identify what further information they felt was needed. This process was aimed at providing the participants with all the information and viewpoints they needed to make an assessment of the energy options themselves. They were therefore also given the opportunity to ask additional questions to the experts by raising a question flag. To facilitate data analysis, this breakout session was audio taped per table.

After the deliberation session, the participants enjoyed afternoon tea (16). During this break, they had the opportunity to ask questions to the experts in a more informal setting. Meanwhile, the facilitators summarised the group discussions and gathered with the lead facilitator who collected and clustered the feedback from all tables for feedback into the group after the break. Key messages and concerns were extracted from the table summaries.

The break was followed by a plenary session (17), in which the key messages and concerns were shared with the larger group. The group was asked whether the messages and concerns as identified by the facilitators indeed accurately and comprehensively reflected the group discussions. After endorsement by the group, some time was spent to discuss what participants had learned during the day.



Figure 2.2 *Summary of key message by facilitators*

Participants were subsequently administered the post-workshop questionnaire, which in part contained the same questions as the pre-workshop questionnaire to allow for comparing knowledge and attitudes with respect to climate change and low emission technologies before and after information (18). Similarly, the voting process was repeated to provide direct feedback to the group about attitude changes during the day (19), after which the participants were thanked (20) and the workshop was finished (21).

2.3 Information materials

The three presentations that participants received during the day were based on the Australian presentations, translated into Dutch, transferred to ECN layout, and adapted to reflect the Dutch situation. As in the Australian workshops, the presentations aimed to deliver a balanced viewpoint of each technology, highlighting both advantages and drawbacks. One difference between the Dutch and Australian presentations is that we have shortened each presentation because we expected that shorter presentations would better keep the attention of the audience. An additional benefit was that by doing so more time was left for discussion.

2.4 Data collection and analysis

The quantitative and qualitative structure and measures used in this workshop were based on previous group process research (Ashworth et al, 2006; Ashworth & Gardner, 2006).

2.4.1 Quantitative data collection

Quantitative data was collected using questionnaires which participants completed at the beginning, during and at the end of the process (pre-, process, and post-workshop questionnaires). A copy of each questionnaire is contained in Appendix A.

The questionnaires served two purposes. First, to quantify and assess participants' actual and perceived knowledge and understanding of climate change and energy technologies, as well as their attitudes towards these topics and present and intended future pro-environmental behaviours including willingness to pay more for electricity.

Second, to assess the effectiveness of the large group process including elements of trust, building social identity and group cohesion. Participants' expressed identification with others on their table and in the workshop, which was measured in both the process and the post-workshop questionnaire, will be discussed in a separate paper and will therefore not be presented in this report.

Furthermore, the questionnaires contained questions to measure perceived purpose of the workshop (to inform, persuade, etc.), perceived fairness of the workshop, trust in various information sources, impression of the presentations and the speakers, and evaluation of several parts of the workshop such as the information presented, the possibilities for interaction, and the facilities offered. Finally, the pre-questionnaire also contained background demographic measures and the post-questionnaire asked participants to indicate about which topics they would like to receive more information.

The quantitative measures of pre- and post- questionnaire are described by reporting descriptive statistics mainly (means and standard deviations). The effectiveness of the process was assessed primarily using the change in means of the measures. T-tests ($p < .05$) were used to identify if the changes in responses were significant. Measures which did not look to compare change in pre-and post-questionnaire, were reported using descriptive statistics.

2.4.2 Qualitative data collection

Collecting qualitative data was important given the research aim to explore Dutch society's knowledge and acceptance of climate change and low emission energy technologies. The qualitative analysis helped to identify in more detail participants' "actual" knowledge as well as provide more detail about the concerns they may have about particular energy technologies.

The table conversations were structured according to three main topics: climate change, energy technologies and own behaviour. The conversations were audio-taped and summarised by the table facilitators to identify key themes. Each facilitator summarised the discussion of each of these topics together with the participants on one post-it. These post-its were collected during the afternoon tea and categorised by the facilitators together with the lead facilitator. Based on these post-its and the audio-tapes the facilitators made more elaborate minutes of the group conversations including quotes of the participants structured according to each of the three topics. These minutes have been input for this report.

Another opportunity to provide individual feedback was provided to the respondents at the end of the post questionnaire, where participants were invited to write down any remaining comments to share with the organisers. Some of these comments are also integrated in this report to illustrate the findings of the day.

2.5 Differences between methodology applied in Australia and in the Netherlands

Recruitment

The recruitment for the Dutch Large Group Process has been handled by a market research agency, which ensured a representative sample of the Dutch population (based on age, sex and education). By making use of the recruitment agency it was also possible to avoid using the name of ECN in the invitation, which would have revealed that the topic of discussion was

energy-related. The invitation used the term ‘current topic’ instead of a ‘societal relevant’ topic as used in the Australian invitations. This was done to avoid a bias towards more societal engaged participants.

Process

In previously held workshops in Australia, the possibility to ask questions was offered immediately after each presentation. In the Dutch workshop, the lead facilitator decided to have the presentations first and then have one round of questions and discussion. The decision was a spontaneous improvisation by the lead facilitator to make up for some lost time.

Information materials

All three presentations were adapted in order to better suit the Dutch situation, and to better align the content with the expected (knowledge) level of the participants as found in previous research¹. Presentations #1 (on climate change and energy use) and #2 (on energy technologies) were based on the presentations by CSIRO. Presentation #3 (on CCS) was completely new, as it was about a current Dutch CCS project (the ROAD-project). The slides of the presentations can be found in Appendix C.

Quantitative data collection and analysis

The questionnaires (see Appendix A) were copied from the questionnaires used in the Australian large group processes. They were translated into Dutch and minimal changes to the questions were added to fit the Dutch context. Minor adaptations include the measurement of willingness to pay in Euros instead of Australian dollars and changes in demographic questions such as household type and income. More fundamental changes are listed below.

- In the questions about knowledge of climate change and related issues, two topics were added: ‘methods for electricity production’ and ‘use of fossil fuels’. Previous research on public awareness and knowledge has shown that people often do not know where electricity comes from and the extent to which fossil fuels are still used for energy production. Because it can be argued that a basic understanding of these topics is a prerequisite for understanding the need for climate mitigation we agreed with CSIRO to assess awareness and knowledge of these topics in the present sample as well, thereby also enabling comparison with previous research findings.
- In several questions, such as the objective measure of actual public knowledge that was included in addition to self-reported knowledge levels, statements pertaining to Australia had to be replaced with statements pertaining to the Netherlands.
- In the list of questions about participants’ own past behaviour, we added the statement “I have opted for ‘green’ electricity and/or ‘green’ gas when given the choice” because in the Netherlands these options do not always require people to pay extra. To the statement “I pay extra for ‘green’ electricity” we added “or ‘green’ gas” since this is also a common option for Dutch households.
- Regarding the question “trust in information sources”, some modifications to the answer options have been made. Furthermore, we modified the way in which the question was asked.

Qualitative data collection and analysis

The data collection during the table conversations has been adapted from the Australian methodology. To save time, the audio tapes of the conversations were not transcribed verbatim. Instead, the table facilitators used the audio tapes to make minutes of the discussions, using a template for structuring the feedback including relevant quotes structured into three categories (climate change, energy technologies and own behaviour). They also added quotes of the participants to these minutes. These were translated and used as input for this report.

3. Participant characteristics

3.1 Age and gender

Males and females were almost equally represented amongst the workshop participants (Table 3.1). This representation differed slightly from the Dutch population. Whereas in the Dutch population the share of females is slightly larger than the share of males, the share of males is slightly larger in the workshop sample. Age ranged from 18 to 67, with a mean of 43 years. The age in the sample is lower than the overall population, as the mean age of the Dutch population over 18 is 48 years. Specifically, the age groups of 65 and over are underrepresented in the sample, while the other age groups (with the exception of 35-39 years) are overrepresented.

Table 3.1 *Age and gender of workshop participants (compared with Dutch population)*

Age	Sample			Population Statistics		
	Male	Female	Total	Male	Female	Total
18-24	7.2%	4.5%	11.7%	5.5%	5.4%	10.9%
25-29	3.6%	5.4%	9.0%	3.9%	3.8%	7.7%
30-34	3.6%	6.3%	9.9%	3.8%	3.8%	7.7%
35-39	3.6%	4.5%	8.1%	4.5%	4.5%	9.0%
40-44	8.1%	7.2%	15.3%	5.0%	4.9%	9.9%
45-49	6.3%	4.5%	10.8%	5.0%	4.9%	9.9%
50-54	4.5%	6.3%	10.8%	4.5%	4.5%	9.0%
55-59	8.1%	4.5%	12.6%	4.2%	4.1%	8.3%
60-64	6.3%	4.5%	10.8%	4.1%	4.1%	8.2%
65 and over	0.0%	0.9%	0.9%	8.5%	10.9%	19.4%
Total	51.4%	48.6%	100.0%	49.0%	51.0%	100.0%

Note: Dutch population data are derived from the Statistics Netherlands (CBS).

3.2 Education

Table 3.2 summarises the distribution of education levels in the sample. The entries in the table are translations of the Dutch labels for education levels, listed from least to most advanced. Approximately one-third (31%) of the sample had completed tertiary level education (Technical and Vocational Training for 18+ and University). Two respondents did not answer. The remainder of the sample but one had completed some form of secondary education.

Table 3.2 *Education level*

Education	Frequency	Percentage
Primary Education	1	0.9%
Technical and Vocational Training for 12-16 Year-Olds	14	12.6%
School for Lower General Secondary Education	10	9.0%
Technical and Vocational Training for 16-18 Year-Olds	35	31.5%
Higher General Secondary Education / Pre-University Education	15	13.5%
Technical and Vocational Training for 18+	26	23.4%
University Education	8	7.2%
Did not answer	2	1.8%
Total	111	100.0%

3.3 Employment

Table 3.3 shows that the majority of the respondents were in paid employment (68%), with a large share employed in the private sector (51%). Of the rest, approximately 5% was unable to work, 6% was unemployed, 6% performed home duties, 2% was retired, 4% indicated they were student, and 3% indicated they occupied themselves otherwise. 7 respondents did not answer this question (6%).

Table 3.3 *Employment status*

	Frequency	Percentage
Employed (Non-Governmental)	56	50.5%
Self-Employed	12	10.8%
Employed (Governmental)	7	6.3%
Home Duties	7	6.3%
Unemployed	7	6.3%
Disabled (Unable to work)	6	5.4%
Student	4	3.6%
Retired / Pension Recipient	2	1.8%
Other	3	2.7%
Did not answer	7	6.3%
Total	111	100.0%

Table 3.4 shows that the largest share of participants were employed in the financial and administrative sectors (14%), followed by the technology sector (9%), health care (8%), and consultancy (7%). Automation (5%), marketing/PR/sales (5%), and managers (4%) follow. Purchasing and logistics (2%), human resources (2%), (semi-)governmental (2%), and research and education (1%) all take a low share. As much as 22% did not fit the categorisation presented in the questionnaire.

Table 3.4 *Occupation classes*

Occupation	Frequency	Percentage
Not in paid employment	16	14.4%
Financial / Administrative	16	14.4%
Technology	10	9.0%
Health Care	9	8.1%
Consultancy	8	7.2%
Automation	6	5.4%
Marketing / PR / Sales	5	4.5%
Manager	4	3.6%
Purchasing and Logistics	2	1.8%
Human Resources	2	1.8%
(Semi-)Governmental	2	1.8%
Research and Education	1	0.9%
Other	24	21.6%
Did not answer	6	5.4%
Total	111	100.0%

3.4 Household structure

Table 3.5 shows that a couple with children was the household type most common among workshop participants (36%). An additional 5% was part of a household formed by a single parent with children. Close to half of the respondents lived either as part of a couple with no children (28%) or alone (17%). The remainder described his/her household as living with

parents/family (10%). Three respondents lived in a household type not covered by the categorisation in the questionnaire (3%). One person did not answer this question.

Table 3.5 *Household type*

Household type	Frequency	Percentage
Couple with children	40	36.0%
Couple with no children	31	27.9%
Single person household	19	17.1%
Living with parents/family	11	9.9%
Single parent with children living at home	6	5.4%
Other	3	2.7%
Did not answer	1	0.9%
Total	111	100.0%

The majority of respondents were part of a two-person household (37%), as shown in Table 3.6. Equal shares of respondents were part of a single person, three-person, or four-person household (each 17%). 7% of respondents were part of a five-person household, one respondent of a six-person household, and one respondent of a seven-person household. Three respondents did not answer the question.

Table 3.6 *Household size*

Household size	Frequency	Percentage
1	19	17.1%
2	41	36.9%
3	19	17.1%
4	19	17.1%
5	8	7.2%
6	1	0.9%
7	1	0.9%
Did not answer	3	2.7%
Total	111	100.0%

3.5 Income

Table 3.7 shows that household gross incomes ranged from less than €10 000 to more than €150 000. Median income was €50 000 - €59 999 (see Table 3.7). Approximately 40% of households earned between €40 000 and €70 000, whereas approximately 25% earned less than €40 000 and 16% more than €70 000.

Table 3.7 *Household incomes*

Household income	Frequency	Percentage
<€10 000	4	3.6%
€10 000 - €19 999	7	6.3%
€20 000 - €29 999	9	8.1%
€30 000 - €39 999	8	7.2%
€40 000 - €49 999	15	13.5%
€50 000 - €59 999	16	14.4%
€60 000 - €69 999	15	13.5%
€70 000 - €79 999	5	4.5%
€80 000 - €89 999	5	4.5%
€90 000 - €99 999	2	1.8%
€100 000 - €124 999	3	2.7%
€125 000 - €149 999	2	1.8%

Household income	Frequency	Percentage
>€150 000	1	0.9%
Did not know	5	4.5%
Refused to answer	13	11.7%
Did not answer	1	0.9%
Total	111	100.0%

4. Results: environmental profile

This section describes the environmental beliefs and behaviours held by the participants at the beginning of the workshop based on the outcomes of the pre-questionnaire.

4.1 Pro-environmental beliefs

Fifteen statements about environmental beliefs (see Appendix B, Table B1) were averaged to form a single summary measure that ranged from 1= anti-environmental beliefs, 4 = unsure, to 7 = pro-environmental beliefs. The group average was 4.70 (SD 0.66), reflecting a moderate level of pro-environmental beliefs. The highest mean level of agreement was accorded to the statement that 'Plants and animals have as much right as humans to exist', the second-highest mean level of agreement was to the statement 'Despite all our special abilities humans are still subject to the laws of nature'. The lowest mean level of agreement was accorded to the statement 'The earth has plenty of natural resources if we just learn how to develop them'.

4.2 Pro-environmental behaviours

Participants were presented with a list of 9 pro-environmental behaviours and were asked whether they engaged in these behaviours (see Figure 4.1). Five behaviours were engaged in by over four-fifths of participants: conservation of electricity in the home (91%), garbage recycling (89%), the use of energy efficient light bulbs (88%), the considering of energy efficiency ratings when purchasing white goods (85%), and bringing one's own bags when shopping (85%). About three-fifths of the participants chose green gas and/or electricity, and another 57% conserves electricity in the workplace. A quarter paid extra for green electricity and green gas (27%). Only a very minor share of the participants had a solar hot water system in their home (5%).

These behaviours have been aggregated into a single measure, termed the 'environmental impact score', by summing each participant's 'yes' responses. This yields a variable that ranges from 2 to 9 (out of a total maximum range of 0-9), with a mean of 5.8 and a standard deviation of 1.6 aggregated over all participants.

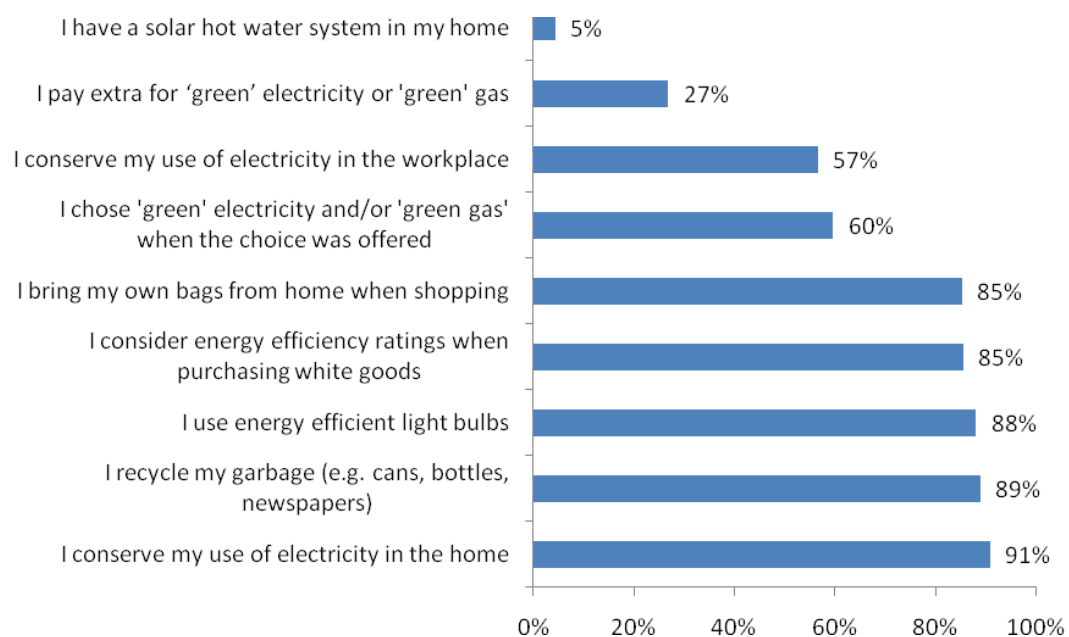


Figure 4.1 *Environmental behaviours (percentage of participants who circled 'yes')*

5. Results: knowledge and attitudes

In this section, the participant self-rated knowledge and attitudes regarding climate change and energy technologies are presented. These have been measured in both the pre- and post-workshop questionnaires, thus making it possible to highlight changes that occurred during the workshop.

The participants' self-reported knowledge increased significantly during the workshop, both knowledge about climate change and related issues, and about energy technologies. The outcomes of the questionnaires show that the general attitude among participants (both pre- and post-workshop) was that climate change is an important issue and that more should be done to address it – although they did not think that a higher electricity price would lead to reduced greenhouse gas emissions. This is illustrated by some quotes of participants during the table conversations.

Climate change is everywhere

The government could oblige everyone to put solar cells on their roofs

Support for different energy technologies varied widely. Generally, both pre-workshop and post-workshop, support for renewable energy technologies was larger than support for non-renewable technologies, with solar and wind energy claiming the highest levels of support. Levels of support for some (but not all) energy technologies changed significantly over the course of the workshop. CCS turned out to be a controversial energy technology.

5.1 Knowledge about climate change and related issues

The participants were presented with eight factual statements about climate change and related issues, and asked to indicate whether these statements were true or false. The statement most widely recognised (and incorrectly so) as true was 'Recycling paper, cardboard, metals, and glass saves on materials, but does not help in saving water, energy, or fuel'. The statement least often recognised as false was 'About half of Dutch carbon emissions come from electricity generation'.

For each respondent, the qualification (true/false) of the statements was aggregated by assigning a score of -2 to a correct answer and a score of +2 to an incorrect answer, and then summing across all eight statements. The summary measure of all participants thus obtained yielded a score of -0.2, indicating that overall slightly more incorrect than correct answers had been provided. The scores per question are presented in Appendix B.

Participants were also asked to rate their own knowledge of climate change and related issues (see Figure 5.1). Participants indicated that they knew least about the relationship between the price of electricity and greenhouse gas emissions, and most about energy conservation in the home. Results show that self-rated knowledge about all eight issues increased significantly during the workshop.

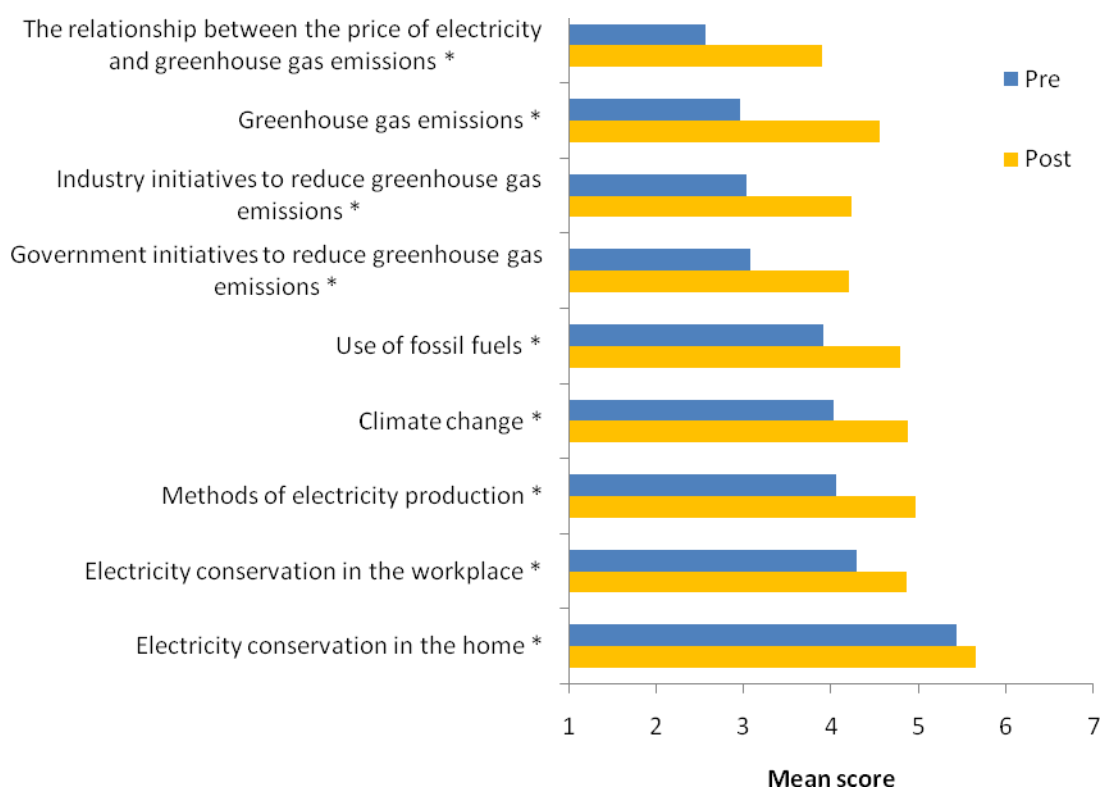


Figure 5.1 *Mean knowledge of climate change and related issues (pre- vs. post-workshop)*

Note: Knowledge was measured as (1) no knowledge, (4) moderate knowledge, (7) high knowledge.

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

5.2 Knowledge of energy sources and related technologies

Participants' self-rated knowledge of all energy sources and related technologies significantly increased during the workshop (Figure 5.2). The largest increase was seen in carbon capture and storage (CCS), to which one of the three presentations was entirely devoted. Other large increases were witnessed in technologies that are not yet broadly applied in the Netherlands or are otherwise not frequently brought to the attention of the general public, e.g., gas from coal seams, geothermal energy, and wave/tidal energy.

The differences in self-rated knowledge between various energy sources and related technology was smaller after the workshop than before the workshop. The range between the lowest and highest rating was 1.8 prior to the workshop and 1.5 after the workshop.

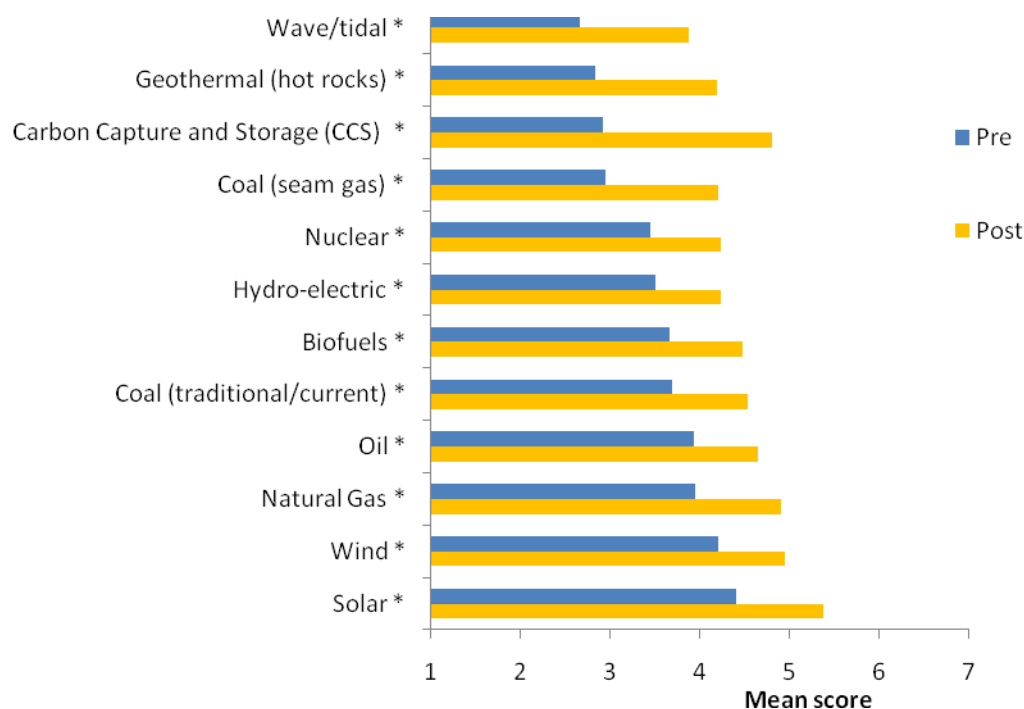


Figure 5.2 *Mean changes in knowledge of energy sources and related technology (pre- vs. post-workshop)*

Note: Knowledge was measured as (1) no knowledge, (4) moderate knowledge, (7) high knowledge.

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

5.3 Attitudes toward climate change and related issues

Most participants supported six out of seven statements about climate change and related issues that were offered, both before and after the workshop (Figure 5.3). Over 80% of respondents at least moderately agreed with these six statements (percentage of participants answering “moderately agree”, “agree”, or “strongly agree”). It can therefore be concluded that the majority of participants considered climate change an important issue that needs to be addressed.

There was less agreement among the participants on the statement that increasing the price of electricity can help to reduce greenhouse gas emissions. Over 60% of the participants at least moderately disagreed with this statement (percentage of participants answering “moderately disagree”, “disagree”, or “strongly disagree”) prior to the workshop. Over the course of the workshop, this percentage dropped significantly, but after the workshop approximately 50% of participants still disagreed with the statement.

Four other statements also showed significant differences between the pre- and post-workshop questionnaire results. After the workshop, participants agreed more strongly that the production of electricity is a major contributor to greenhouse gas emissions, and that industry as well as government should be doing more to reduce greenhouse gas emissions. Over the course of the workshop, the agreement that people should be doing more to promote electricity conservation in the home dropped slightly, but significantly. For two statements, that climate change is an important issue for the Netherlands and that people should be doing more to promote energy

conservation in the workplace, no significant differences between the pre- and post-workshop questionnaire results were observed.

How strongly do you agree with the following?

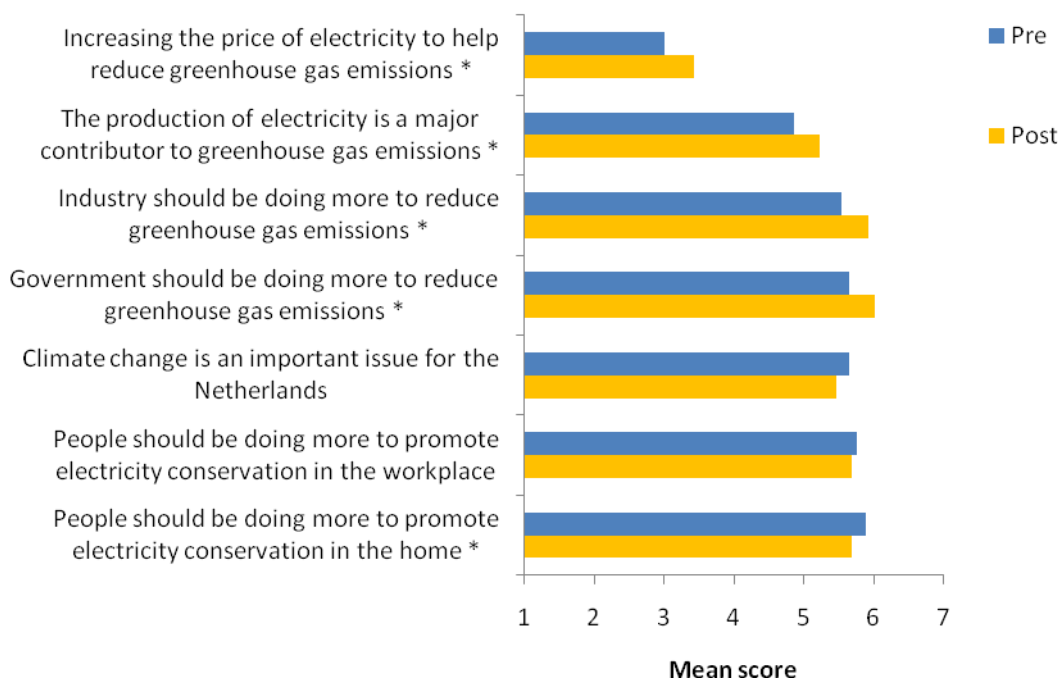


Figure 5.3 Mean changes in attitude toward climate change and related issues (pre- vs. post-workshop)

Note: Attitude was measured as (1) strongly disagree, (4) unsure, (7) strongly agree.

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

5.3.1 Climate change

Workshop participants considered climate change an important issue, as illustrated by the fact that over 80% agreed to this statement before and after the workshop. In the group discussions, there was a fairly broad consensus that climate change indeed exists, although there was some discussion on its extent. Some participants were also unsure about the extent to which climate change is caused by human activity. This is reflected in the statements that participants made during the discussions:

The climate is changing faster than before. That's the feeling I have.

It's a cycle, in 1000 years it will be colder again.

What's normal and what's abnormal? That depends on the situation!

Do you think 0.7 degrees (of global mean temperature increase) is a lot?!

Let's first take measurements on the climate for the next 150 years and then see if humankind really has an impact on climate change.

5.3.2 Electricity and climate change

Before the workshop, almost 60% of participants agreed that the production of electricity is a major contributor to greenhouse gas emissions. During the workshop, this share increased to almost 80%. The mean level of agreement thus significantly increased, and the share of participants agreeing or agreeing strongly increased from 28% to 45%.

5.3.3 Doing more to reduce emissions

There was a rather broad agreement that more should be done to reduce greenhouse gas emissions. The questionnaire results show that participants think that all societal actors have a responsibility in this reduction effort. There is substantial agreement concerning the statements that government and industry should do more to reduce greenhouse gas emissions. Likewise, the statements that people should do more to conserve electricity in the home and in the workplace receive substantial support. Some quotes of the participants during the table conversations illustrate these findings.

Creating a better environment starts with changing your own behaviour.

If governments around the world would invest half of environmental tax revenue in renewable energy, the problem will be solved in ten years time.

Comparing the pre- and post-workshop questionnaire results reveals that the agreement that government and industry should do more to reduce greenhouse gases increases, whereas the agreement that electricity should be conserved in the home and the workplace decreases slightly (the decrease is only significant for conservation of electricity in the home). This indicates that the information and/or the group discussions have – on average – introduced the participants to the notion that it is others (industry, government) rather than themselves that should step up efforts to reduce greenhouse gas emissions.

As consumers we feel weak, we are powerless.

The government must take the lead in combating climate change.

The government considers the budget as its main concern, rather than the environment.

5.3.4 Increasing the price of electricity

Of the seven statements on the attitude toward climate change and related issue, there was least agreement on the statement that increasing the price of electricity will help to reduce greenhouse gas emissions (Figure 5.3). However, there was a significant difference between the pre- and post-workshop results. 17% of participants agreed with this statement prior to the workshop, whereas 26% agreed after the workshop.

Some participants indicated that they were willing to pay a bit more for electricity, provided that generation methods with a low environmental impact would then be used. There was, however, substantial scepticism regarding whether more expensive, ‘green’ electricity was indeed truly green:

If it's a bit more expensive, but better for the environment, then I'll do it (i.e. pay more).

Who checks whether green electricity is green? The wiring is the same.

Furthermore, some participants had the impression that governments and energy companies are not primarily concerned with the climate but are acting only to create their own income.

I don't want to pay more, let them hand in some of those bonuses!

In the end it is all about money. Not about the best solutions, but about the cheapest.

They [the government, red] don't think primarily about climate change, but about their own wallet.

Climate change is a market opportunity for the company doing the CCS demonstration project. Someone is going to make a lot of money with this!

5.4 Attitudes toward energy sources

Attitudes toward energy sources varied substantially (Figure 5.4). Generally, the support elicited in the questionnaires for renewable options was larger than for non-renewable options. Before the workshop, participants were unsure about some options, e.g. 43% was unsure about CCS and 41% about coal seam gas. After the workshop, the share of participants that indicated they were unsure about individual technologies was substantially lower, e.g. 19% for CCS and 20% for coal seam gas. Greater self-rated knowledge (see Section 5.2) may have contributed to the reduction of these percentages.

On average the support for coal, coal seam gas, nuclear, oil, natural gas, geothermal and wind increased during the workshop, while the support for CCS, biofuels, wave/tidal, hydro-electric and solar decreased.

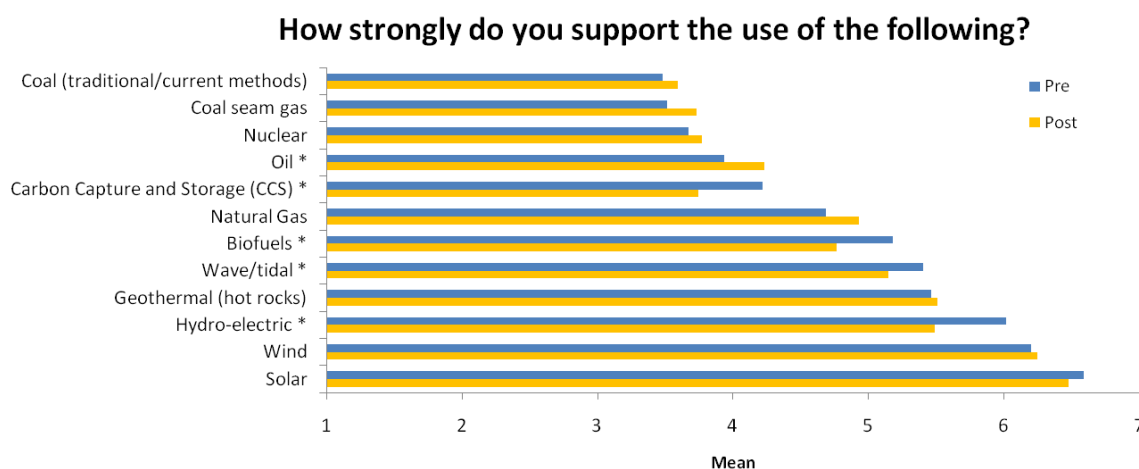


Figure 5.4 Mean changes in attitudes to energy sources and related technologies (pre- vs. post-workshop)

Note: Attitude was measured as (1) strongly disagree, (4) unsure, (7) strongly agree.

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

5.4.1 Solar and wind

Solar and wind energy generated the largest support among workshop participants, both before and after the workshop. At the end of the workshop, 96% of participants supported solar energy, with 69% expressing strong support (Figure 5.5). Wind also received support from 96% of the participants, with 48% expressing strong support (Figure 5.6).

Despite these high levels of support, some local problems with both solar and wind energy arose during the discussions. The impact of wind turbines on the landscape and the noise they produce were mentioned as drawbacks. Radiance from solar panels was mentioned as a minor drawback.

There was a general agreement that solar and wind energy should nonetheless be deployed, in a way that minimises these negative impacts. One participant puts the local drawbacks of wind turbines into perspective as follows:

I'd rather have 20 wind turbines in my back yard than one nuclear power plant.

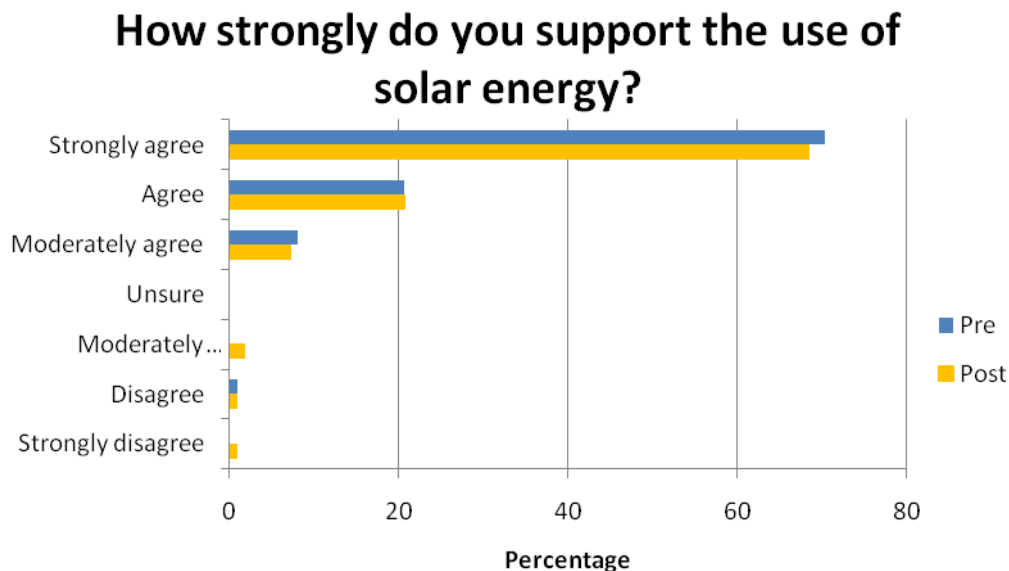


Figure 5.5 Change in response for support for solar energy (pre- vs. post-workshop)

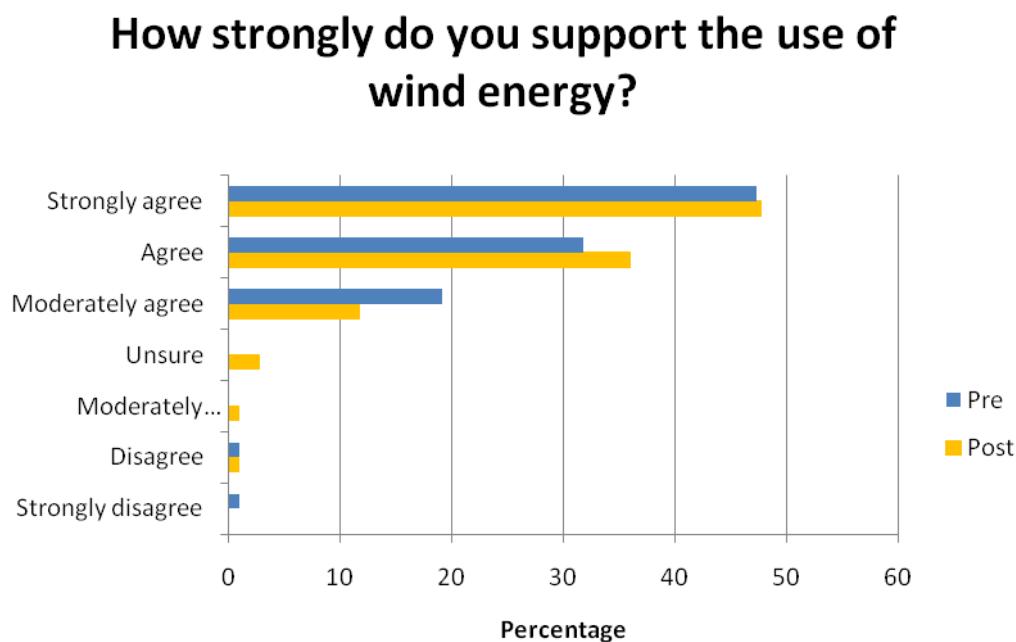


Figure 5.6 Change in response for support for wind energy (pre- vs. post-workshop)

5.4.2 Wave/tidal, hydro-electric, and geothermal

The second-highest levels of support were elicited by the renewable options wave/tidal, hydro-electric, and geothermal energy. At the end of the workshop, about 80% of participants agreed with support for hydro-electric and geothermal energy, and approximately 65% of participants agreed with support for wave/tidal energy.

For both wave/tidal and hydro-electric energy support declined significantly during the workshop, although they still ranked in the top five after the workshop. For both technologies, the information in the expert presentation indicated that their potential for the Netherlands is limited. For hydro-electric energy, the percentage of participants indicating strong support declined from 41% to 26%, and the percentage indicating ‘unsure’ doubled to 12% (Figure 5.7). For wave/tidal energy, the share of participants supporting the technology strongly dropped from 32% to 23%. The percentage of participants answering ‘unsure’ declined from 36% to 24%.

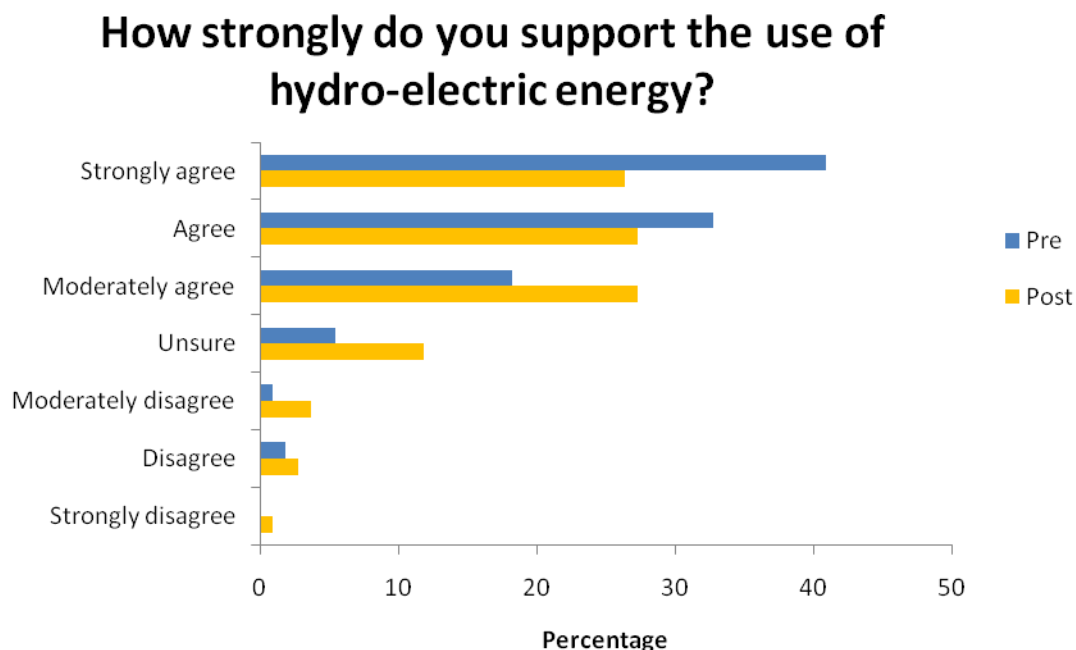


Figure 5.7 Change in response for support for hydro-electric energy (pre- vs. post-workshop)

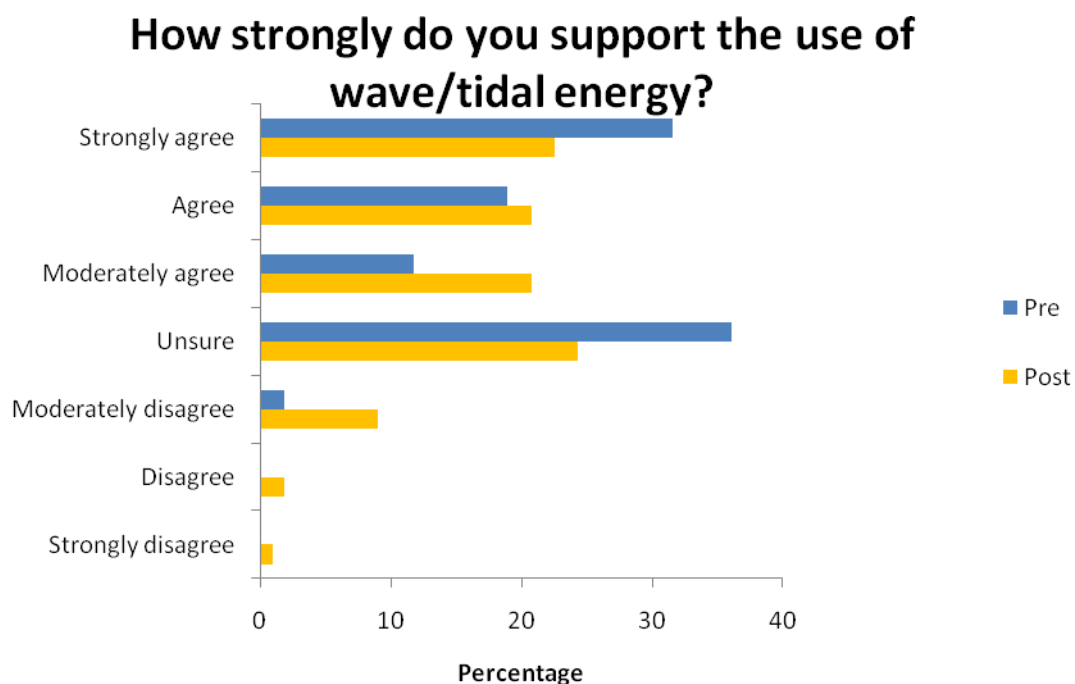


Figure 5.8 Change in response for support for wave/tidal energy (pre- vs. post-workshop)

5.4.3 Coal and oil

Support for coal and oil is low, with support for the two methods for energy generation from coal eliciting the lowest support. Apart from coal and nuclear energy, agreement for support for oil is lowest of all energy technologies.

The support for oil increased significantly during the workshop. A much larger share of participants agreed to the use of oil after the workshop (Figure 5.9). This increase comes mainly from participants that expressed a moderate support or were unsure about the use of oil prior to the workshop. Interestingly, the share of participants that indicated strong support also declined during the workshop, indicating that the positions of participants' on oil have become less extreme.

How strongly do you support the use of oil?

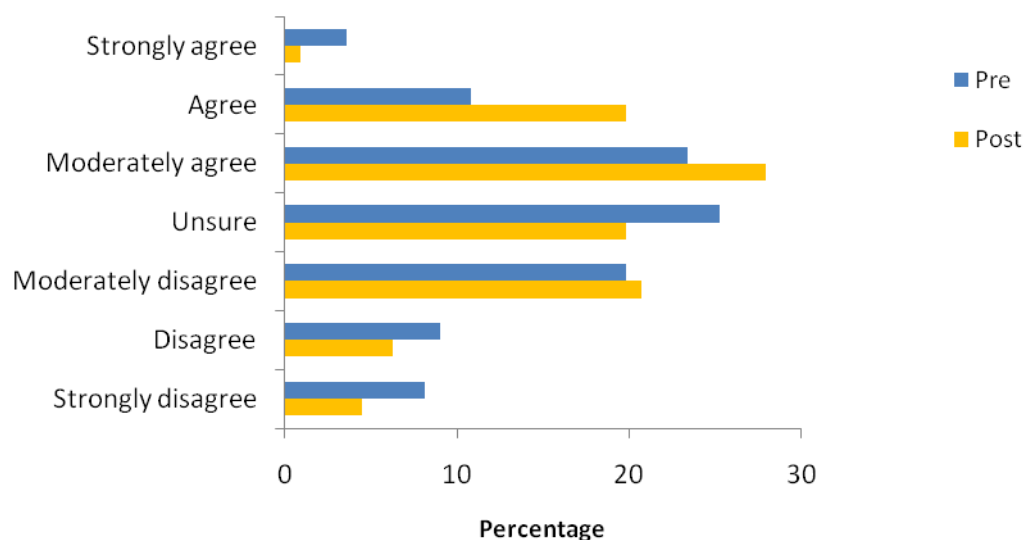


Figure 5.9 *Change in response for support for oil (pre- vs. post-workshop)*

5.4.4 Nuclear

Apart from coal, nuclear energy solicited the least support from participants. Support increased slightly, but not significantly during the workshop. Although the mean increased only slightly, there was some interesting change in the questionnaire results from nuclear energy. Before the workshop, 7% of participants agreed strongly about support for nuclear energy, and 16% checked 'agree'. After the workshop, the share of participants expressing strong support dropped to 5%, but the percentage of participants agreeing increased to 21%. Although support for nuclear energy did therefore not change on average, the positions have become slightly less extreme.

How strongly do you support the use of nuclear energy?

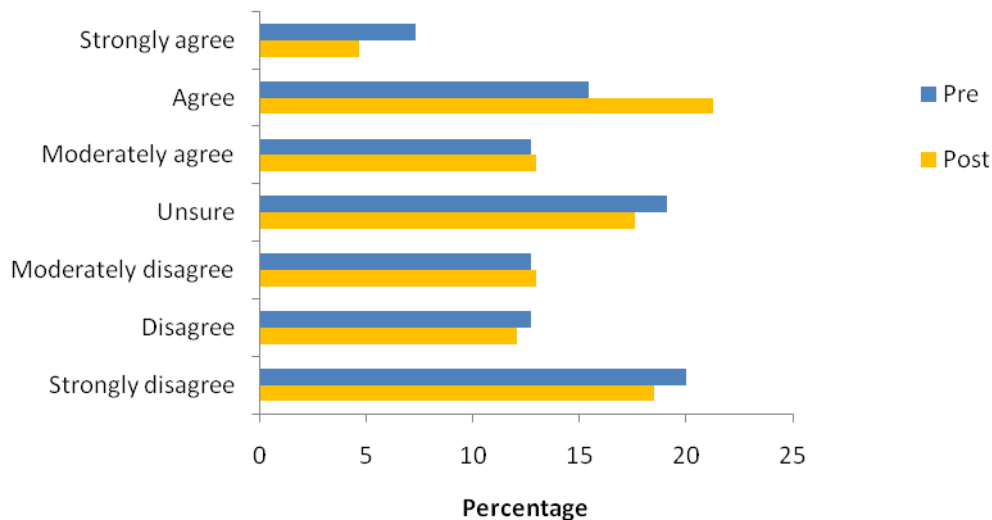


Figure 5.10 Change in response for support for nuclear energy (pre- vs. post-workshop)

5.4.5 Carbon capture and storage (CCS)

Support levels for CCS were only moderate prior to the workshop, and fell sharply and significantly during the workshop. Participants' knowledge about CCS prior to the workshop was low, with only self-reported knowledge of wave/tidal and geothermal being lower. During the workshop, a lot of information on CCS was presented, and self-reported knowledge increased significantly. This information has allowed participants to form an opinion on CCS – the percentage of participants that indicated that they were unsure about the support for CCS decreased from 43% to 19% during the workshop (Figure 5.11). The percentages of participants that indicated agreement or moderate agreement declined, and not a single participant expressed strong support for CCS after the workshop.

Quotes from the group discussions illustrate that CCS is a controversial technology:

CO₂ simply does not belong back in the earth.

CCS is an inefficient stopgap.

If something explodes on the North Sea, than...

If you put CO₂ underground, there is a chance that they start drilling in the future at that same place which would release the CO₂ in the atmosphere. That would be a big problem!

A lot of good engineers work on CCS, but they also make mistakes.

How strongly do you support the use of CCS?

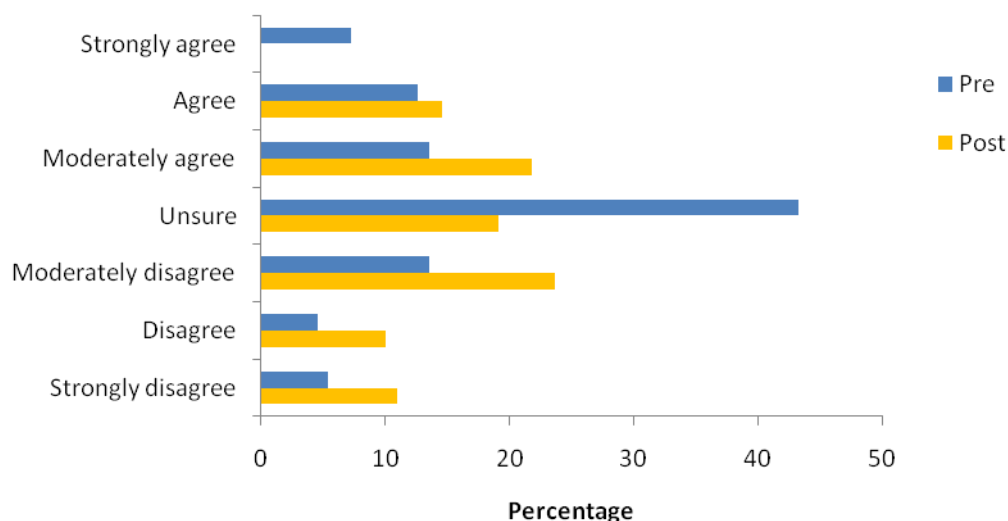


Figure 5.11 *Change in response for support for CCS (pre- vs. post-workshop)*

5.4.6 Biofuels

Of all renewable options, biofuels gained the least support. Prior to the workshop, biofuels received slightly more support than natural gas. After the workshop, natural gas received slightly more support than natural gas, a significant decline that breaks the pattern that all renewable options receive more support than non-renewable options. The decline is especially due to the proportion of participants that expresses strong support for biofuels, which almost halves from 25% (pre-workshop) to 13% (post-workshop) (Figure 5.12). The decline in support for biofuels offers a potential explanation for the increase in support for oil, which are the two technologies with a major application in the transport sector.

How strongly do you support the use of biofuels?

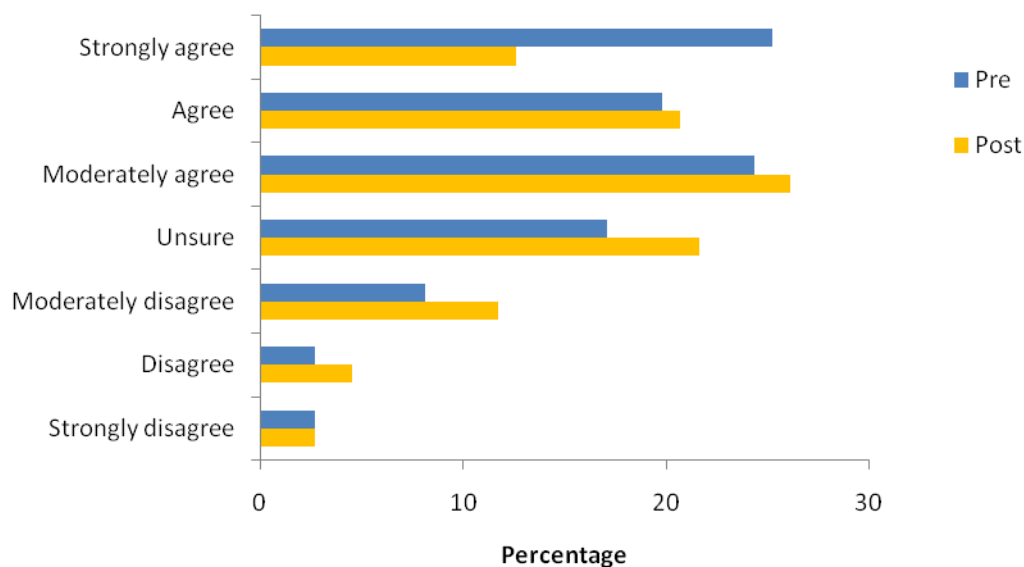


Figure 5.12 *Change in response for support for biofuels (pre- vs. post-workshop)*

5.4.7 Natural gas

Of the non-renewable energy technologies, natural gas receives the largest support. The support for natural gas increased slightly, but not significantly during the workshop. The positions on natural gas did become slightly more extreme. The percentage of respondents that were unsure about the use of natural gas declined from 20% to 12%, whereas the percentages of respondents that answered 'agree', 'moderately agree', as well as 'moderately disagree' all increased (Figure 5.13).

How strongly do you support the use of natural gas?

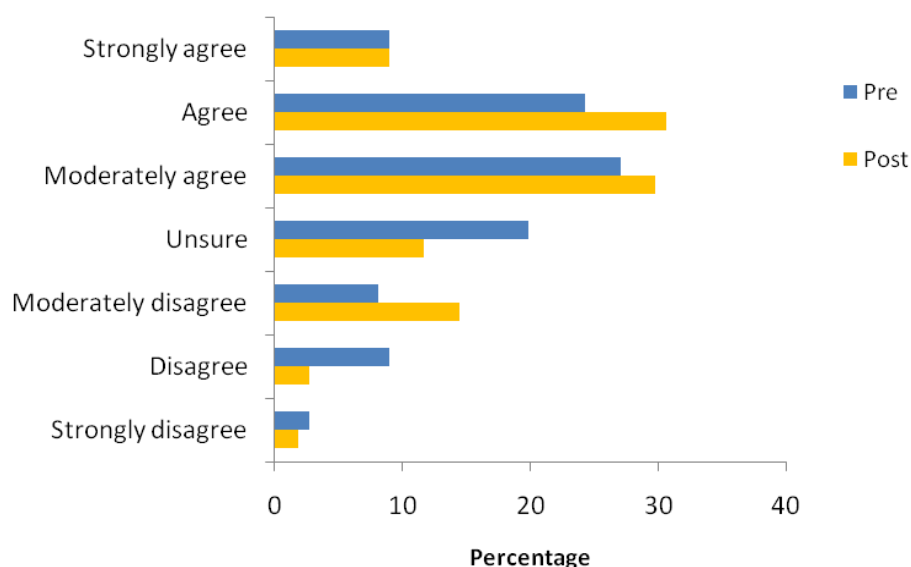


Figure 5.13 Change in response for support for natural gas (pre- vs. post-workshop)

5.5 Energy technology preferences

At the start and end of the workshop, participants were asked to rank the 12 energy technologies in order of priority if they were able to allocate public funds to their development and/or implementation. Participants were asked to assign a score of 1 to the most preferred technology, and a score of 12 to the least preferred technology. A low score thus indicates a larger preference for a technology. The rankings of the pre- and post-workshop are listed in Table 5.1. Figure 5.14 lists the mean funding priority order of each technology before and after the workshop.

Table 5.1 Ranking of average technology funding priority (pre- and post-workshop)

	Pre workshop rank	Post workshop rank
Solar	1	1
Wind	2	2
Hydro-electric	3	3
Wave/tidal	4	5
Geothermal (hot rocks)	5	4
Biofuels *	6	7
Natural Gas *	7	6
Carbon Capture and Storage (CCS)	8	10
Oil	9	9
Nuclear *	10	8
Coal seam gas	11	12
Coal (traditional/current methods)	12	11

*indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

Funding priority order

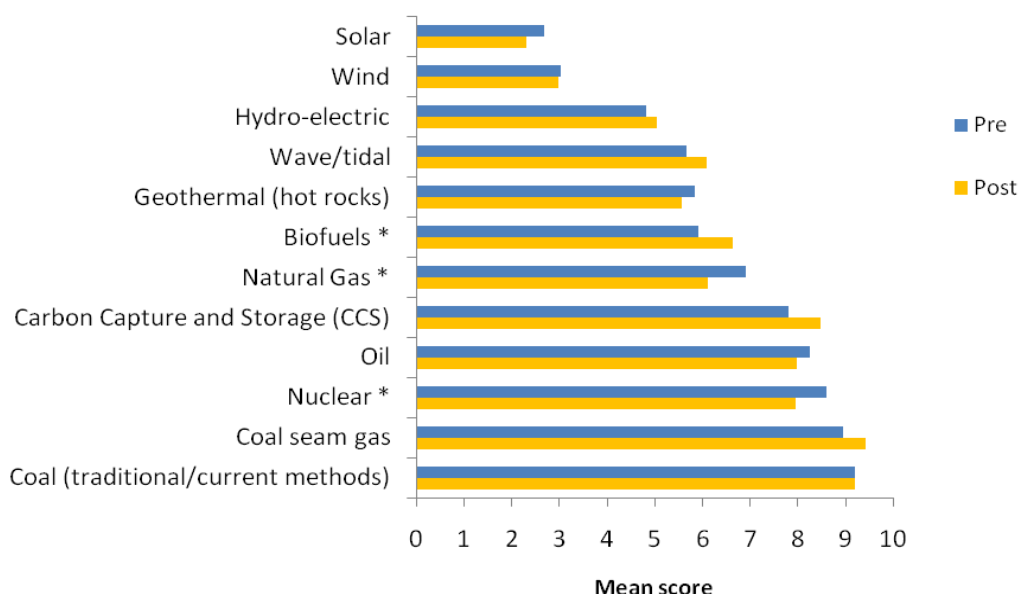


Figure 5.14 *Changes in priority of the mean preferred energy technology (pre- vs. post-workshop)*

Note: Priority was measured from 1=highest priority to 12=lowest priority

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

Both Table 5.1 and Figure 5.14 show that in general, participants rank renewable technologies higher than non-renewable technologies. Solar, wind, hydro-electric, geothermal, and wave/tidal energy top the list both before and after the workshop. The bottom end of the list is consistently formed by coal (both traditional and seam gas), nuclear, oil, and CCS. Biofuels and natural gas fill in between these two groups, and have switched places during the course of the workshop. Prior to the workshop, biofuels were preferred over natural gas, after the workshop natural gas was preferred over biofuels. Nuclear energy was the only other option for which there was a significant difference in preference before and after the workshop.

Table 5.1 shows that solar energy was the most preferred option both before and after the workshop. Looking further into the data, we found that 84% of the participants ranked solar energy among the three most preferred option before the workshop, and 86% did so after the workshop.

Wind was ranked as second-most preferred option both prior to and after the workshop, with 73% and 79% ranking wind in the top-3 of most preferred options before and after the workshop, respectively.

Hydro-electric energy ranked as third mean priority before and after the workshop, with 41% and 27% of participants ranking hydro-electric energy in the top-3 of the preferred options. Overall, however, the shift in mean funding priority was not significant.

Before the workshop, wave/tidal energy ranked fourth and geothermal energy fifth. After the workshop, these two energy technologies had switched places. Before the workshop, 30% of participants had put wave/tidal energy among their three most preferred options. This percentage had declined to 17% after the workshop (which did not represent a significant decline in mean ranking score). Geothermal energy was ranked among the three most preferred

options by 16% of respondents before the workshop, and by 25% of participants after the workshop (which did also not represent a significant increase).

Before the workshop, wave/tidal energy ranked fourth and geothermal energy fifth. After the workshop, these two energy technologies had switched places. Before the workshop, 30% of participants had put wave/tidal energy among their three most preferred options. This percentage had declined to 17% after the workshop. Geothermal energy was ranked among the three most preferred options by 16% of respondents before the workshop, and by 25% of participants after the workshop. However, shifts in mean funding priority order were not significant.

Biofuels and natural gas were ranked as sixth and seventh respectively in the pre-questionnaire, and had traded places in the post-questionnaire. For both technologies this shift was tested as significant. While biomass was scored among the top 6 technologies to be funded by 67% of the participants in the pre-questionnaire, this percentage had declined to 46% in the post-questionnaire. Natural gas scored among the top six for 37% of the participants pre-workshop and for 57% post workshop.

Before the workshop, CCS was indicated as the 8th ranking option, and nuclear energy as the third least-preferred option (10th). After the workshop, these technologies had switched places. Before the workshop, 26% of participants ranked CCS among the three least-preferred option, and 56% did so for nuclear energy. After the workshop, 45% ranked CCS among the three least-preferred options, and also 45% did so for nuclear energy. The mean change in rank was tested significant only for nuclear energy.

Oil ranked ninth both pre- and post-workshop. Before the workshop, 75% of participants ranked oil among the six least preferred options. After the workshop, this percentage had increased to 79%. Finally, coal consistently ranked as least-preferred option. Before the workshop, traditional methods for using coal for energy applications were least preferred, with 62% of participants ranking it among the three least preferred options. After the workshop, this position was taken by gas from coal seams, with 57% of participants ranking it among least preferred options.

6. Energy related behaviours and intentions

This section describes participants' willingness to pay more for electricity if it reduced greenhouse gas emissions and other behavioural intentions as expressed in the questionnaires.

6.1 Willingness to pay more for electricity

Participants were asked whether they would be willing to pay more for electricity if it reduced greenhouse gas emissions. This question was asked in the pre-questionnaire and in the post-questionnaire. Figure 6.1 shows that about 43% of the participants were willing to do so before the workshop. It also shows that this figure had not changed significantly after the workshop.

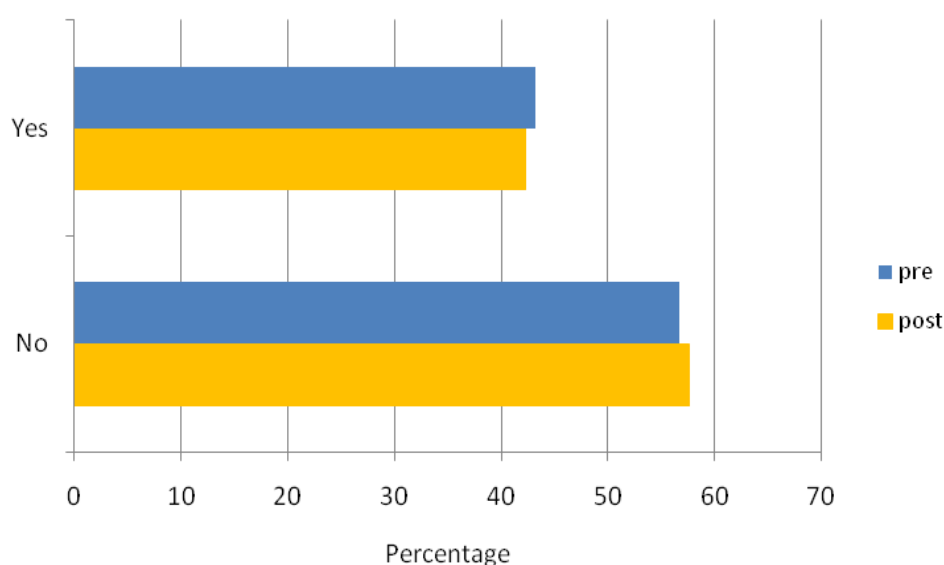


Figure 6.1 *Percentage of participants that indicated to be willing ('yes') or non-willing ('no') to pay more for electricity if it reduced greenhouse gas emission*

Participants who answered that they would be willing to pay more for electricity if it reduced greenhouse gas emissions were also asked how much they would be willing to pay extra. Table 6.1 shows that there was hardly any difference between pre- and post-workshop answers. 27% (26%) of total participants indicated they were willing to pay up to 20€ extra per quarter of a year pre-workshop (post-), 10% (7%) would want to pay up to 40€ per quarter, and 6% (8%) would want to pay more than 40€ per quarter extra.

Table 6.1 *Willingness to pay more for electricity*

	Percentage	
	Pre	Post
If you answered yes, which of the following best describes how much more you would be willing to pay for your household electricity if it reduced greenhouse gas emissions		
I would pay up to 20€ extra per quarter	27.0	26.1
I would pay up to 40€ extra per quarter	9.9	7.2
I would pay up to 60€ extra per quarter	2.7	3.6
I would pay up to 80€ extra per quarter	1.8	2.7
I would pay up to 120€ extra per quarter	0.9	0.9
I would pay more than 120€ extra per quarter*	0.9	0.9

	Percentage	
Did not answer yes	56.8	58.6
Total	100	100

6.2 Intended behaviours as a result of the workshop

Participants were asked in the post-workshop questionnaire whether they intended to change their behaviour as a result of the workshop. Figure 6.2 shows that there is a (relatively) strong intention to show behaviour generally considered to be more environmentally friendly, with exception of ‘paying extra for green electricity’ and ‘installing a solar heating system in home’. The highest mean score is given for ‘continuing current behaviour, because I already do most of the above’, suggesting little room for change on the behaviours mentioned.

In the pre-workshop questionnaire, participants were asked whether they already exhibit given behaviours (see Section 4.2). For each of the behaviours, a large difference between the answers of participants who answered ‘yes’ on whether they already exhibit the behaviour and the answers of participants who answered ‘no’ can be observed. Participants who said they already show the behaviour in the pre-workshop questionnaire mostly agree with intending to show this behaviour in the future, whereas participants who said they did not show the behaviour in the pre-workshop, said to be unsure to show such behaviour in the future.

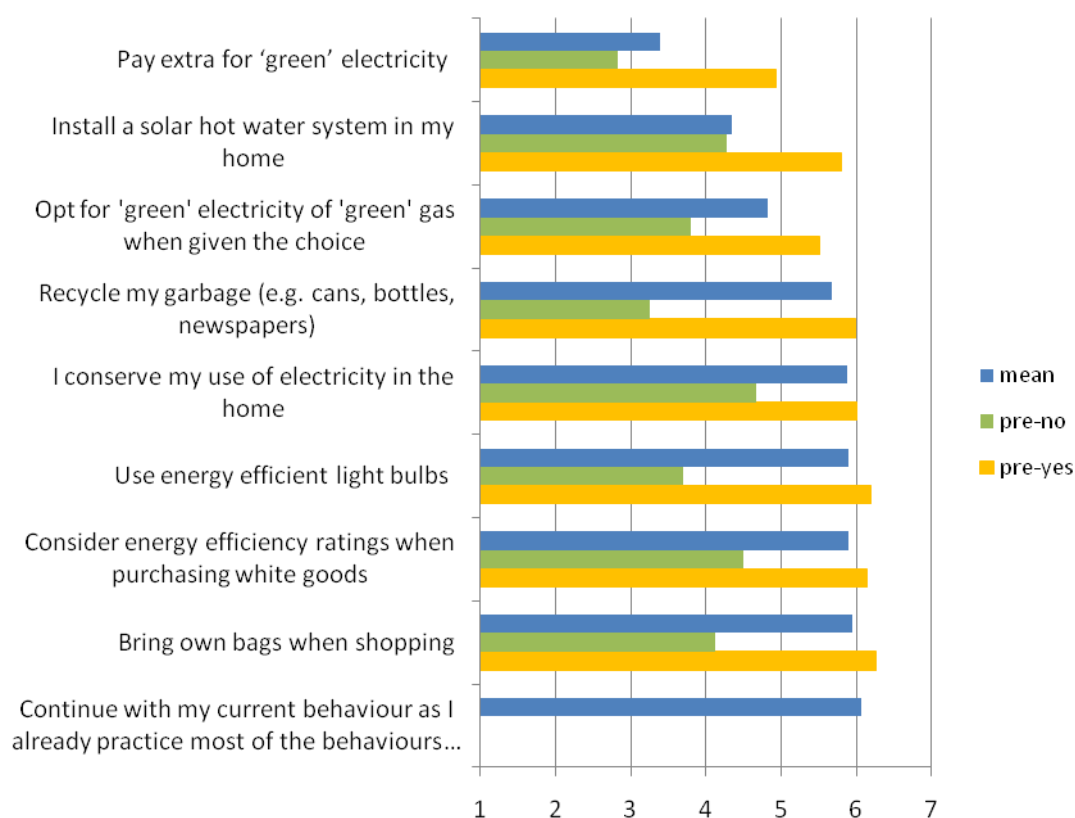


Figure 6.2 *Intended behaviour changes as a result of the workshop (intentions measured as (1) strongly disagree, (4) unsure), (7) strongly agree – note that the number of people in the pre-no and pre-yes groups vary per question)*

7. Communication

This section presents participant perceptions of trust in sources of climate change information as answered in the pre-workshop questionnaire.

7.1 Trust in information sources

Participants expressed varying and fairly low mean levels of trust in 15 nominated sources of information on climate change when asked in the beginning of the workshop. Highest trust was accorded to research institutes and academic articles, closely followed by family and friends. Social network sites and industry are least trusted as information sources. Trust in all other sources was rated between 4 and 5 on average on the scale of 1 to 7.

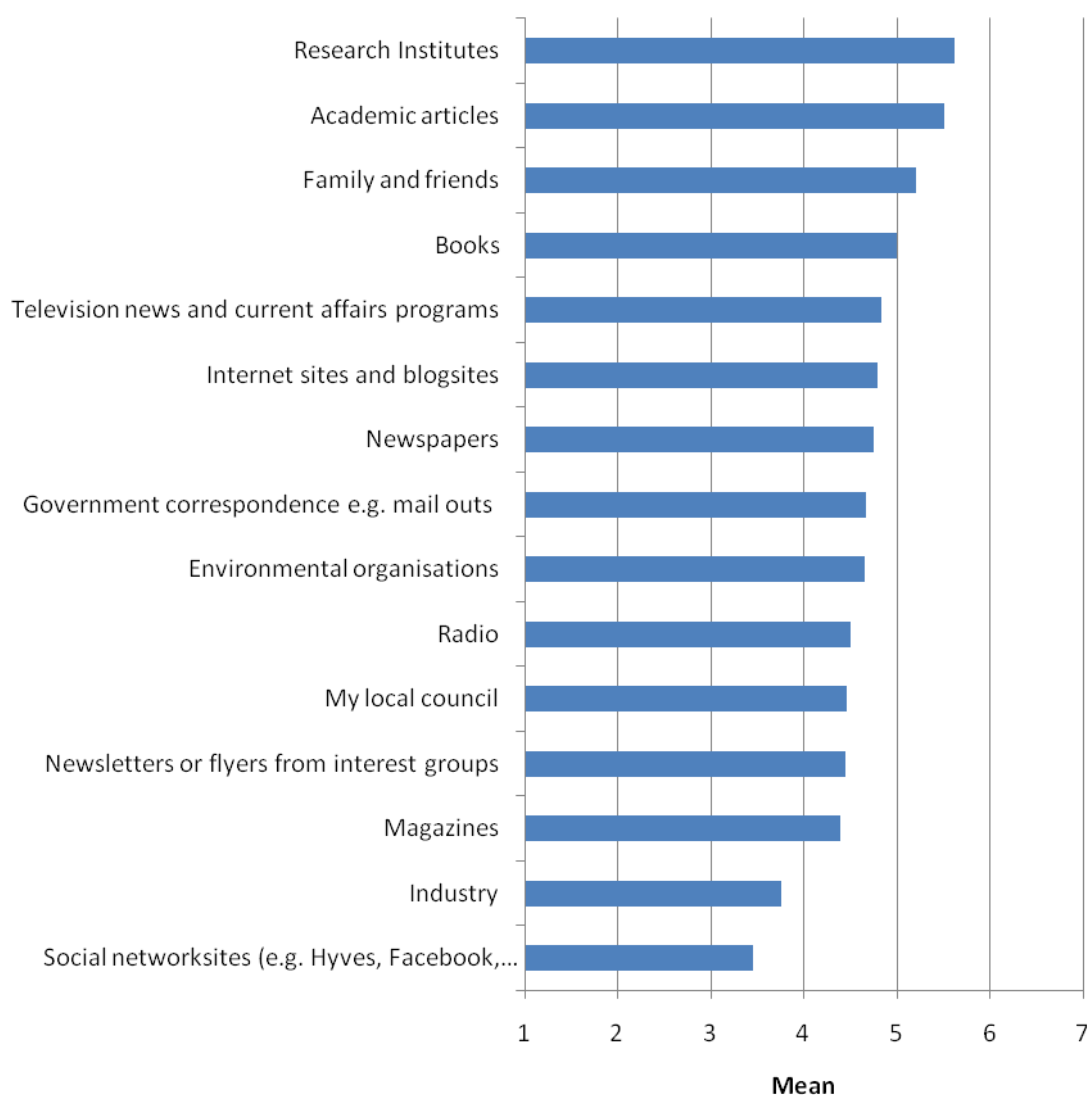


Figure 7.1 *Trust in information sources (Trust measured as (1) no trust, (4) unsure, (7) much trust)*

8. Key issues arising from discussions

In this section, we distil from the participants' comments the major issues and concerns arising in the table conversations in response to the information presented. During the group discussions the topics of the presentations were discussed further.

8.1 Climate change and related topics

Participants discussed the importance of climate change and the influence of humans on it. Different opinions were raised. Also the impact of climate change was discussed. Related to this, some participants called for more information on climate change from the government to raise more awareness.

Climate Change already existed before humans: where for example have the dinosaurs gone?

Climate change is everywhere

Climate change exists now more than in the past. That's a feeling I have.

Do you think that 0.7 degrees in 100 years is fast?!

Participants raised the global scale of both the causes of and solutions for climate change as well as the relevance of climate change specifically for the Netherlands as a densely populated and for a large part situated below sea level.

We are responsible for the growth of Chinese energy use because we buy the products from them.

It could be that we get wet feet and that water comes over the dikes

8.2 Energy resources and accompanying technologies

Solar energy is perceived as a good solution by many participants as well as (offshore) wind. When discussing renewable energy, participants often raise the local impacts of wind and solar. Geothermal is also considered as a preferred resource. Few participants raise energy saving as the best solution. Some participants have doubts about the sustainability of biofuels and biomass.

First biomass was the greatest thing since sliced bread, but now it has gone out of fashion

Many participants indicated that the government should play a larger role in the development of renewable energy and energy savings by forcing individuals, industry and energy companies to implement it. Current national governmental policies are according to some participants contra productive for renewable energy or at least less effective than in other countries.

In the end it's all about money. Not about the best solutions, but about the cheapest

If all governments worldwide would invest half of the environmental taxes in renewable energy, the problem would be solved within 10 years.

The subsidies and regulation must be made much easier.

Some participants indicate that they need more information about the costs and revenues of the different renewable energy resources to make a better comparison. Mostly the government is appointed as supplier of information.

How much CO₂ converts a tree compared to the energy use of appliances in your home or car. That's something you need to know.

Many participants are not positive about CCS. They see it as a temporally solution or have doubts about the safety. Participants also indicate that a discussion about safety is also important for nuclear.

A disadvantage of CCS is that it costs a lot of energy. In what sense is it than useful when it's an interim solution and would it not be better to directly work on other solutions?

When you compare it with a disease than CCS is not the cure, but delaying death or battling symptoms.

There are very good engineers involved in CCS, but they can make mistakes too.

If the safety [of nuclear, red] improves, then I'll become more of a proponent.

8.3 Willingness to pay more

About half of the participants are not willing to pay more for energy. The other half is willing to pay more when the money is really used to invest in renewable energy.

When it's a little more expensive, but better for the environment, then I will do it.

They [government, red.] think primarily about their own wallet and only secondary about the environment. But yes, we do the same thing. I also buy a cheaper steak instead of the more expensive ecological one. And if I can get grey electricity cheaper than green electricity, than I choose grey.

I don't want to pay more, let them hand in their bonuses first!

8.4 Current behaviour related to energy saving and green energy

Many participants think that the impact of households on climate change is small. Many state however that even though the effect of your own behaviour is little, you should still do something. Participants also realise the impact of their own (buying) behaviour. Many doubts exist however among the participants about whether green electricity is really green.

I have little affection with energy and climate. I recycle en have efficient light bulbs, but that's it.

But we do it ourselves as well. We don't want to pay more for green electricity. We buy microwave meals and separately packed cookies. Than we, as consumers, should indicate that we don't want that anymore.

Who checks if the green electricity is really green? The cable is the same.

8.5 Interest in the topic

When participants were recruited for the workshop they were not told of the topic, as such they had average interest in the topic. Not surprisingly, during the workshop many gained more insight into climate change as an issue. They also gained an appreciation for the complexity and difficulty of finding solutions to best address climate change. This is shown in the comments of participants expressed during the day or written down in the questionnaire at the end of the day.

I found it an interesting and informative day

Climate change is not a hot topic in my age group [22 year old]

A good initiative to discuss presented information with the participants

I'm here to learn!

9. Key messages from the process

At the end of the workshop table facilitators summarised key messages, which represented the voice and opinions of the participants per table on climate change, energy technologies and the own behaviour of consumers in general and the participants themselves particularly. These were issues that arose as part of the small group deliberative process and participants collectively per table were satisfied that these were representative of the key messages of their group as a whole. The key messages were consequently compiled, written on post-its and collected by the lead facilitator who distilled key outcomes from these. These key outcomes were presented to the workshop group as a whole.

Table 9.1 *Key messages on Climate change*

Climate change	
Key messages	Opinions of separate tables (on the post-its)
1. Consumers have power	<i>A small majority on the table is convinced that consumers collectively have power and can influence the industry. Climate change is important. Consumer has power (buying behaviour), but should use this power more. Also outside the Netherlands, much must happen.</i>
2. Climate change exists. But doubts about the size of the role of humans.	<i>Majority of the table thinks that climate change exists partly due to human action. Climate change is important for the Netherlands due to our energy use and low geographical situation. The majority of the table thinks that climate change exists. It is however unclear which part is caused by humans and which part is caused by nature. Climate change is an important problem. But it must become clear that humans are the cause. Climate change has always existed, but is speeded up by human action. It must be tackled worldwide. Climate change is a problem, but it must not be exaggerated it. It must be solved worldwide by making choices (e.g. population growth, economy, technology) The use of fossil fuels is probably the cause of the increasing greenhouse effect. But worldwide use of fossil fuels is increasing less fast than the table thought. The problem might thus be smaller than expected? The government must set a good example for energy saving. We could work with a 'norm system'. Below the norm means tax incentives. Above the norm means tax increases Opinions on 'to do' for consumers differ at the table</i>
3. Climate change exists, but the role of humans is limited	<i>Humans have limited role in climate change. There are mainly natural causes as glacial periods and solar activity. It is not proven that humans cause climate change. We cannot solve it and negotiations produce not enough / are fruitless. Climate will change anyway. Better to save energy because you have to clean up your own mess. But everyone should do this in his/her own manner.</i>

Table 9.2 *Key messages on Energy technologies*

Key messages	Energy technologies <i>Opinions of different tables (on the post-its)</i>
4. As many different energy resources as possible should be used, including CCS and nuclear	Not one energy technology is right. A combination is needed. More money should be invested in research. All, including small initiatives must be supported. You have to use as many resources as possible. Also nuclear is accepted as transition. CCS is test technology. Opinions at the table differ. Good that it is tested offshore (not onshore). You have to continue investing in Technologies to save energy and at the same time renewable resources like solar, wind, hydro, tidal, geothermal and nuclear fusion. Don't invest in resources that compete with other sectors like food, etc.
5. Unsure about CCS and nuclear because of the risks	Invest in new energy saving technologies. CCS is too uncertain. Different opinions about nuclear at the table. Risks of different energy resources including nuclear and CCS. New technology is good, but has many disadvantages. We don't know enough about CCS and risks are not well discussed. Renewable energy technologies must be used. CCS: continue with tests. Stop when it is not working.
6. Preferably no CCS because it's an interim solution	Solar, wind and geothermal are preferred technologies to use. CCS makes it possible to reach targets on the short term. But CCS is probably an expensive solution that demands money that could be spend better to solar, wind and geothermal. CCS is uncertain and temporal Investing in sustainability is important Half of table is in favour of nuclear Preferred is a combination of different technologies. Majority at the table thinks that it would be better to invest the money needed for CCS in real solutions (renewable energy). CCS is temporal because it's making use of fossil fuels. CCS is not a good solution for the long term. Because safety issues are not clear (in case of a disaster) and there is doubt whether the CO₂ will stay underground on the longer term. It's an interim solution. Why should you do CCS when you have better options? And will it not be out of date by the time you can store CO₂ at a large scale and other technologies are available. CCS is only interim solution. Not enough focus on emission trading and social aspects on global scale. Solar, wind and hydropower should become profitable within limited inconvenience. Using less energy is the only solution.
7. PV seems to be the best solution but give more information about costs	PV seems to be the best solution, but it must be fair over the whole chain (costs). Thus solid, objective information is needed.

Table 9.3 *Key messages on own behaviour*

Key messages	Own behaviour ² Opinions of different tables (on the post-its)
8. Give insights in and information about waste of energy.	A lot of energy is still wasted. This should be curbed by consciousness raising, feedback on costs, insights in energy bills. Saving energy is important. Many people take action on this. Discussion about the topic is important, but different opinions about where to find the right information.
9. Paying a little extra is fine, as long as it is not too much. Give insights in investments and stimulate innovation	Majority of the Group wants to do and pay a little extra as long as it is clear what companies do and the government provides feedback. When something is a little more expensive but good for the environment, the majority of the table will buy it. When the difference becomes too large (e.g. ecological meat), the group does not buy the environmental products What can you do yourself? • Energy efficient appliances • Correct other people, but everyone needs to join • Energy efficient acting People are not willing to pay a lot, energy may become a little more expensive but that is not fair towards poor people.
10. Small behaviour changes for consumers (no extra investments), but large steps must be taken by governments	No-one at the table wants to pay more because it is not spent well. We do already enough small things and are used to luxury NIMBY effect is mentioned. People do small things to save energy (switching off the lights). Inconsistent subsidy policies are bad for the growth of PV. Energy use will probably not decrease but increase similar to the last 50 years. . All little bits help (own Behaviour). But only at high level influence can be made. All countries have to join. Own wallet is important.
11. Different opinions about effect own behaviour	Part of the table thinks that changing your own behaviour has little effect and is not visible. Few at the table changed their behaviour drastically. The table has diverse opinions about effectiveness of behaviour change Households have small direct influence, but large indirect influence. The government must influence directly.

² Only 11 out of the 12 tables discussed own behaviour.

Literature

- Ashworth, P., G. Quezada, Y. Van Kasteren, N. Boughen, G. Paxton, S. Carr-Cornish & C. Booth (2009): *Perceptions of low emission energy technologies: Results from an Adelaide large group workshop*. CSIRO, Kenmore Qld, Australia.
- Marks, L. et al. (2004): *Designing Food Supply Chains to Enhance Public Acceptance of Agricultural Biotechnology: Understanding the Consumer*. Final Report of the IMBA project. University of Missouri.
- Moon, W. & S.K. Balasubramanian (2003): *Willingness to pay for non-biotech foods in the U.S. and U.K.* Journal of Consumer Affairs, 37(2), 317-339.
- Pachauri, R.K., A. Reisinger, eds. (2007): *Climate change 2007: Synthesis report: Contribution of Working Groups I, II and III to the Fourth assessment report of the Intergovernmental Panel on Climate Change*. Geneva, 104 p.
- Slovic, P. (1993): *Perceived risk, trust and democracy*. Risk Analysis, 13(6), 675-682.

Appendix A Pre-workshop, process and post-workshop questionnaires

VRAGENLIJST VOORAFGAAND AAN DE WORKSHOP

Met deze vragenlijst willen we een aantal van uw standpunten over klimaatverandering en energie meten. Uw antwoorden maken deel uit van een groot onderzoeksproject naar de standpunten van het Nederlandse publiek over deze onderwerpen. Het invullen van deze vragenlijst kost u ongeveer 20 minuten.

Wij danken u hartelijk voor uw medewerking

SECTIE 1: IDENTITEITSCODE

Om uw antwoorden te kunnen analyseren moeten we deze kunnen koppelen aan andere vragenlijsten die u in de loop van de dag voor ons invult. Om dit te kunnen doen, maar tegelijkertijd uw anonimiteit te waarborgen, vragen we u om een anonieme identiteitscode aan te maken en uw tafelnummer in te vullen. Deze identiteitscode kunt u maken met behulp van onderstaande instructies.

Op onderstaande streepjes vult u het volgende in: **de eerste twee letters van de voornaam van uw moeder of voogd(es)** (bijv. Marie wordt MA), **gevolgd door de dag en maand van uw verjaardag** (als u bijv. geboren bent op 2 april, dan schrijft u hier 0204). In dit voorbeeld wordt de ID-code dan **MA0204**.

VUL HIER UW ID-CODE IN: ____ ____ ____ ____ ____ ____

VUL HIER UW TAFELNUMMER IN ____

SECTIE 2: OVERTUIGINGEN EN WAARDEN

In deze sectie willen we uw mening over het milieu en de samenleving meten.

VRAAG 1: MENINGEN OVER HET MILIEU

Hieronder staat een aantal uitspraken over de relatie tussen de mens en de natuur. *Omcirkel* bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

In welke mate bent u het eens of oneens met de volgende uitspraken?	Ze er mee oneens		Weet ik niet (4)				Ze er mee eens	
We naderen het maximaal aantal mensen dat de aarde aankan	1	2	3	4	5	6	7	
De mens heeft het recht om de natuurlijke omgeving aan te passen om in zijn/haar behoeften te voorzien	1	2	3	4	5	6	7	
Wanneer de mens ingrijpt in de natuur heeft dit vaak rampzalige gevolgen	1	2	3	4	5	6	7	
Dankzij de vindingrijkheid van de mens houden we de aarde leefbaar	1	2	3	4	5	6	7	
De mens maakt grof misbruik van de natuurlijke omgeving	1	2	3	4	5	6	7	
De aarde heeft voldoende natuurlijke bronnen. We hoeven alleen maar te leren hoe we deze kunnen benutten	1	2	3	4	5	6	7	
Planten en dieren hebben net zo veel bestaansrecht als mensen	1	2	3	4	5	6	7	
De natuurlijke balans is sterk genoeg om de gevolgen van de moderne industrie op te vangen	1	2	3	4	5	6	7	
Ondanks onze bekwaamheden zijn mensen nog steeds overgeleverd aan natuurwetten	1	2	3	4	5	6	7	
De zogenaamde 'ecologische crisis' die op ons af zou komen, wordt sterk overdreven	1	2	3	4	5	6	7	
De aarde is als een ruimteschip met een beperkte hoeveelheid ruimte en hulpbronnen aan boord	1	2	3	4	5	6	7	
De mens is voorbestemd om te heersen over de rest van de natuur	1	2	3	4	5	6	7	
Het natuurlijk evenwicht is er kwetsbaar en gevoelig voor verstoring	1	2	3	4	5	6	7	
De mens zal uiteindelijk voldoende weten over de werking van de natuur om deze te kunnen beheersen	1	2	3	4	5	6	7	
Als we zo doorgaan zullen we in de nabije toekomst een grote ecologische ramp ervaren	1	2	3	4	5	6	7	

SECTIE 3: BEWUSTZIJN & KENNIS

Deze sectie gaat over uw bewustzijn van en kennis over klimaatverandering, energiebronnen, energietechnologieën en andere bijbehorende zaken.

VRAAG 2: BEWUSTZIJN OVER KLIMAATVERANDERING EN AANVERWANTE ZAKEN

<i>Omcirkel hier 'ja' of 'nee' om aan te geven of u wel eens gehoord heeft van de volgende onderwerpen:</i>		
Klimaatverandering	JA	NEE
Broeikasgasemissies	JA	NEE
Methoden voor elektriciteitsproductie	JA	NEE
Gebruik van fossiele brandstoffen	JA	NEE
Initiatieven van de overheid om broeikasgasemissies te verminderen	JA	NEE
Elektriciteitsbesparing thuis	JA	NEE
Initiatieven van de industrie om broeikasgasemissies te verminderen	JA	NEE
Elektriciteitsbesparing op de werkplek	JA	NEE
De relatie tussen de elektriciteitsprijs en broeikasgasemissies	JA	NEE

VRAAG 3: BEWUSTZIJN OVER ENERGIEBRONNEN EN BIJBEHORENDE TECHNOLOGIEËN

<i>Omcirkel hier 'ja' of 'nee' om aan te geven of u wel eens gehoord heeft van de volgende onderwerpen:</i>		
Windenergie	JA	NEE
CO ₂ -afvang en -opslag	JA	NEE
Nucleaire energie	JA	NEE
Hydro-elektriciteit (elektriciteit uit waterkracht)	JA	NEE
Kolenverbranding (traditionele/huidige methoden)	JA	NEE
Aardgas	JA	NEE
Geothermische energie (aardwarmte)	JA	NEE
Zonne-energie	JA	NEE
Biobrandstoffen	JA	NEE
Olie	JA	NEE
Golfslag-/getijdenenergie	JA	NEE
Gaswinning uit kolen	JA	NEE

VRAAG 4: KENNIS OVER KLIMAATVERANDERING EN BIJBEHORENDE ZAKEN

Omcirkel bij elk onderwerp het cijfer dat het meest overeenkomt met uw kennis over de volgende onderwerpen.

Hoeveel kennis heeft u van de volgende onderwerpen?	Geen kennis		Gemiddelde kennis				Veel kennis	
Klimaatverandering	1	2	3	4	5	6	7	
Broeikasgasemissies	1	2	3	4	5	6	7	
Methoden voor elektriciteitsproductie	1	2	3	4	5	6	7	
Gebruik van fossiele brandstoffen	1	2	3	4	5	6	7	
Initiatieven van de overheid om broeikasgasemissies te verminderen	1	2	3	4	5	6	7	
Elektriciteitsbesparing thuis	1	2	3	4	5	6	7	
Initiatieven van de industrie om broeikasgasemissies te verminderen	1	2	3	4	5	6	7	
Elektriciteitsbesparing op de werkplek	1	2	3	4	5	6	7	
De relatie tussen de elektriciteitsprijs en broeikasgasemissies	1	2	3	4	5	6	7	

VRAAG 5: KENNIS VAN ENERGIEBRONNEN EN BIJBEHORENDE TECHNOLOGIEËN

Omcirkel bij elk onderwerp het cijfer dat het meest overeenkomt met uw kennis over de volgende onderwerpen.

Hoeveel kennis heeft u van de volgende onderwerpen?	Geen kennis		Gemiddelde kennis				Veel kennis	
Windenergie	1	2	3	4	5	6	7	
CO ₂ -afvang en -opslag (CCS)	1	2	3	4	5	6	7	
Nucleaire energie	1	2	3	4	5	6	7	
Hydro-elektriciteit (elektriciteit uit waterkracht)	1	2	3	4	5	6	7	
Kolenverbranding (traditioneel/huidig)	1	2	3	4	5	6	7	
Aardgas	1	2	3	4	5	6	7	
Geothermische energie (aardwarmte)	1	2	3	4	5	6	7	
Zonne-energie	1	2	3	4	5	6	7	
Biobrandstoffen	1	2	3	4	5	6	7	
Olie	1	2	3	4	5	6	7	
Golfslag-/getijdenenergie	1	2	3	4	5	6	7	
Gaswinning uit kolen	1	2	3	4	5	6	7	

VRAAG 6: KENNIS VAN KLIMAATVERANDERING, ENERGIEBRONNEN EN BIJBEHORENDE TECHNOLOGIEËN

Hieronder vindt u een aantal uitspraken over energie en het milieu. Geef bij elke uitspraak aan of u vindt dat deze waar of onwaar is.

Zijn onderstaande uitspraken waar of onwaar?			
Zodra de infrastructuur is aangelegd, zal CO ₂ -afvang en -opslag emissies uit kolengestookte centrales verminderen zonder extra kosten, met uitzondering van onderhoudskosten.	Waar	Onwaar	Weet ik niet
Klimaatverandering kan helemaal worden verklaard door de natuurlijke veranderlijkheid van klimatologische cycli	Waar	Onwaar	Weet ik niet
Het broeikasgaseffect wordt veroorzaakt door een gat in de atmosfeer van de aarde	Waar	Onwaar	Weet ik niet
Elektriciteitsopwekking uit hernieuwbare bronnen is goedkoper dan elektriciteitsopwekking uit kolen	Waar	Onwaar	Weet ik niet
De energie-inhoud is de energie die gebruikt is om de goederen en diensten die we kopen te maken en te transporteren	Waar	Onwaar	Weet ik niet
In Nederland wordt per persoon minder energie uit fossiele brandstoffen gebruikt dan in alle andere Europese landen (inclusief industrie, landbouw en huishoudelijk energiegebruik)	Waar	Onwaar	Weet ik niet
Ongeveer de helft van de Nederlandse koolstofdioxide emissies (CO ₂) zijn afkomstig van elektriciteitsproductie	Waar	Onwaar	Weet ik niet
Het recyclen van papier, karton, metaal en glas bespaart materiaal, maar geen water, energie of brandstof	Waar	Onwaar	Weet ik niet

SECTIE 4: MENINGEN

In deze sectie willen we uw mening meten over klimaatverandering, energiebronnen, energietechnologieën en gerelateerde andere zaken.

VRAAG 7: UW MENING OVER KLIMAATVERANDERING EN BIJBEHORENDE ZAKEN

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

In welke mate bent u het eens of oneens met de volgende uitspraken?	Ze er mee oneens		Weet ik niet (4)				Ze er mee eens	
Klimaatverandering is een belangrijk probleem voor Nederland	1	2	3	4	5	6	7	
De elektriciteitsproductie levert een grote bijdrage aan broeikasgasemissies	1	2	3	4	5	6	7	
De industrie zou meer moeten doen om broeikasgasemissies te beperken	1	2	3	4	5	6	7	
Mensen zouden meer moeten doen om energiebesparing thuis te bevorderen	1	2	3	4	5	6	7	
De overheid zou meer moeten doen om broeikasgasemissies te beperken	1	2	3	4	5	6	7	
Mensen zouden meer moeten doen om energiebesparing op de werkplek te bevorderen	1	2	3	4	5	6	7	
Het verhogen van de elektriciteitsprijs helpt om broeikasgasemissies te beperken	1	2	3	4	5	6	7	

VRAAG 8: UW MENING OVER ENERGIEBRONNEN EN AANVERWANTE TECHNOLOGIEËN

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

In welke mate bent u het eens of oneens met de toepassing van de volgende energiebronnen/technologieën?	Ze er mee oneens		Weet ik niet (4)				Ze er mee eens	
Windenergie	1	2	3	4	5	6	7	
CO ₂ -afvang en -opslag	1	2	3	4	5	6	7	
Nucleaire energie	1	2	3	4	5	6	7	
Hydro-elektriciteit (elektriciteit uit waterkracht)	1	2	3	4	5	6	7	
Kolenverbranding (traditionele/huidige methoden)	1	2	3	4	5	6	7	
Aardgas	1	2	3	4	5	6	7	
Geothermische energie (aardwarmte)	1	2	3	4	5	6	7	
Zonne-energie	1	2	3	4	5	6	7	
Biobrandstoffen	1	2	3	4	5	6	7	
Olie	1	2	3	4	5	6	7	
Golfslag-/getijdenenergie	1	2	3	4	5	6	7	
Gaswinning uit kolen	1	2	3	4	5	6	7	

VRAAG 9: BEPALING VAN RANGORDE VAN ENERGIEBRONNEN EN ENERGIETECHNOLOGIEËN

Als u geld zou mogen toewijzen aan de ontwikkeling en invoering van onderstaande energiebronnen en energietechnologieën, waaraan zou u dan het meeste uitgeven en waaraan het minste? Geef de volgorde (rangorde) aan waarin u onderstaande energiebronnen en energietechnologieën zou plaatsen als u geld zou mogen toewijzen aan hun ontwikkeling en invoering, waarbij 1 (één) de hoogste prioriteit weergeeft en 12 (twaalf) de laagste prioriteit. NB: U mag de cijfers 1 t/m 12 elk maar één keer gebruiken.

Energiebronnen en energietechnologieën	Prioriteits-rangorde voor financiering
Windenergie	
CO ₂ -afvang en -opslag	
Nucleaire energie	
Hydro-elektriciteit (elektriciteit uit waterkracht)	
Kolenverbranding (traditionele/huidige methoden)	
Aardgas	
Geothermische energie (aardwarmte)	
Zonne-energie	
Biobrandstoffen	
Olie	
Golfslag-/getijdenenergie	
Gaswinning uit kolen	

SECTIE 5: TOEKOMSTIG GEDRAG

In deze sectie willen we uw betalingsbereidheid meten.

VRAAG 10: BEREIDHEID OM MEER TE BETALEN VOOR ELEKTRICITEIT

Sommige mensen willen meer betalen voor elektriciteit met lagere emissies, anderen niet. Zou u bereid zijn meer te betalen voor elektriciteit voor uw huishouden als daarmee broeikasgasemissies worden verminderd?

Zet een *kruis* bij '*ja*' of '*nee*' om uw mening aan te geven:

☐ Nee (Ga naar Vraag 11)

☐ Ja (Gaat u hieronder verder)

Indien u heeft geantwoord met 'ja', welke van onderstaande mogelijkheden geeft dan het beste aan hoeveel meer u bereid zou zijn te betalen voor elektriciteit voor uw huishouden als daarmee broeikasgasemissies worden verminderd? (Kruis slechts *één vakje* aan)

Ik zou minder dan €20 per kwartaal betalen

☐ Geef het bedrag per kwartaal in euro's aan: €_____.

☐ Ik zou tot €20 euro meer betalen per kwartaal (ongeveer €2 per week)

☐ Ik zou tot €40 euro meer betalen per kwartaal (ongeveer €4 per week)

☐ Ik zou tot €60 euro meer betalen per kwartaal (ongeveer €6 per week)

☐ Ik zou tot €80 euro meer betalen per kwartaal (ongeveer €8 per week)

☐ Ik zou tot €120 euro meer betalen per kwartaal (ongeveer €12 per week)

Ik zou meer dan €120 per kwartaal betalen.

☐ Geef het bedrag per kwartaal in euro's aan: €_____.

SECTIE 6: HUIDIG GEDRAG

In deze sectie willen we diverse aspecten van uw huidige gedrag meten.

VRAAG 11: GEDRAG

Hieronder vindt u een lijst met gedragingen die betrekking hebben op het milieu. *Omcirkel* 'ja' of 'nee' om aan te geven welke van de volgende gedragingen voor u van toepassing zijn:

Omcirkel 'ja' of 'nee' bij elk van de volgende uitspraken:	JA	NEE
Ik heb gekozen voor 'groene' elektriciteit en/of 'groen' gas toen ik deze keuze had	JA	NEE
Ik betaal extra voor 'groene' elektriciteit of 'groen' gas	JA	NEE
Ik recycle mijn afval (bijv. blik, glas, papier)	JA	NEE
Ik kijk naar het energielabel als ik witgoed koop (bijv. wasmachine, droger, koelkast)	JA	NEE
Ik gebruik zelf meegebrachte tassen bij het winkelen	JA	NEE
Ik heb een systeem voor warm water uit zonne-energie thuis (zonneboiler)	JA	NEE
Ik gebruik spaarlampen	JA	NEE
Ik bespaar op mijn elektriciteitsgebruik thuis	JA	NEE
Ik bespaar op mijn elektriciteitsgebruik op mijn werkplek	JA	NEE

SECTIE 7: TOEGANG TOT INFORMATIE

In deze sectie willen we vaststellen welke informatiebronnen u doorgaans raadpleegt.

VRAAG 12: VERTROUWEN IN INFORMATIEBRONNEN

Omcirkel het cijfer dat uw vertrouwen in informatie of nieuws van de volgende bronnen het dichtst benadert.

Hoeveel vertrouwen heeft u in de volgende informatiebronnen?	Geen vertrouwen		Weet ik niet (4)				Veel vertrouwen	
Familie en vrienden	1	2	3	4	5	6	7	
Nieuws en actualiteitenprogramma's op televisie	1	2	3	4	5	6	7	
Radio	1	2	3	4	5	6	7	
Kranten (inclusief online kranten)	1	2	3	4	5	6	7	
Internetsites en weblogs	1	2	3	4	5	6	7	
Sociale netwerksites (bijv. Hyves, Facebook, LinkedIn)	1	2	3	4	5	6	7	
Tijdschriften	1	2	3	4	5	6	7	
Nieuwsbrieven of brochures van belangengroepen	1	2	3	4	5	6	7	
Milieuorganisaties	1	2	3	4	5	6	7	
Boeken	1	2	3	4	5	6	7	
Academische artikelen	1	2	3	4	5	6	7	
Mijn gemeente	1	2	3	4	5	6	7	
Correspondentie van de overheid, bijv. via e-mailberichtgeving	1	2	3	4	5	6	7	
Onderzoeksinstituten	1	2	3	4	5	6	7	
De industrie	1	2	3	4	5	6	7	

SECTIE 8: DEMOGRAFIE

Met deze laatste vragen willen wij bepalen welke typen mensen aan dit onderzoek meedoen.

VRAGEN OVER UW HUISHOUDEN

VRAAG 13: GROOTTE VAN UW HUISHOUDEN

Uit hoeveel personen (inclusief uzelf) bestaat uw huishouden? _____

VRAAG 14: TYPE HUISHOUDEN

Welke van de onderstaande beschrijvingen is van toepassing op uw huishouden? (U kunt hier slechts *één* keuze maken)

- | | |
|--|--|
| ☐ Thuiswonend bij ouders/familie | ☐ Samenwonend/Getrouwd zonder kind(eren) |
| ☐ Alleen wonend | ☐ Samenwonend/Getrouwd met kind(eren) |
| ☐ Alleenstaande ouder met thuiswonende kind(eren) | ☐ Anders (bijv. woongroep, studentenhuis) |

VRAAG 15: INKOMEN VAN HUISHOUDEN

Wat is het totale bruto jaarinkomen van uw huishouden? (U kunt hier slechts *één* keuze maken)

- | | | |
|---|--|--|
| ☐ Minder dan €10.000 | ☐ €50.000 - €59.999 | ☐ €100.000 - €124.999 |
| ☐ €10.000 - €19.999 | ☐ €60.000 - €69.999 | ☐ €125.000 - €149.999 |
| ☐ €20.000 - €29.999 | ☐ €70.000 - €79.999 | ☐ €150.000 of hoger |
| ☐ €30.000 - €39.999 | ☐ €80.000 - €89.999 | ☐ Weet ik niet |
| ☐ €40.000 - €49.999 | ☐ €90.000 - €99.999 | ☐ Wil ik niet zeggen |

VRAAG 16: LOCATIE

Wat is de postcode van uw huisadres? _____

VRAAG 17: HUIDIG ENERGIEGEBRUIK

Hoeveel betaalde u vorig jaar ongeveer aan energiekosten voor uw woning? € _____

Hoe vaak betaalt u de energierekening? (U kunt hier slechts *één* keuze maken)

- | | | |
|---------------------------------------|--|---|
| ☐ Maandelijks | ☐ Halfjaarlijks | ☐ Anders (geef uitleg) _____ |
| ☐ Elk kwartaal | ☐ Jaarlijks | |

VRAGEN OVER U

VRAAG 18: LEEFTIJD

Wat is uw leeftijd (in jaren)? _____

VRAAG 19: GESLACHT

Wat is uw geslacht?

☐

Man

☐

Vrouw

VRAAG 20: OPLEIDING

Wat is het hoogste opleidingsniveau dat u heeft afgerond? (U kunt hier slechts één keuze maken)

☐

Basisonderwijs (basisschool / lagere school)

☐

Hoger beroepsonderwijs (hbo, hts, heao, kandidaatsopleiding, bachelor)

☐

Lager beroepsonderwijs (VMBO-beroepsgericht, lts, ito, leao, lhno, huishoudschool, lavo, e.d.)

☐

Universiteit (wetenschappelijk onderwijs, doctoraal/master)

☐

Middelbaar algemeen (vmbo-technisch/gemengd, mavo, ulo, mulo, ivo, vlgo, e.d.)

☐

PhD, promotie, postdoctorale opleiding

☐

Middelbaar beroepsonderwijs (mbo, mts, meao, mhno, mms, inas, mls, e.d.)

☐

Anders

Hoger algemeen en voorbereidend

☐

wetenschappelijk onderwijs (havo, vwo, gymnasium, lyceum, atheneum, propedeuse hbo/wo)

☐

Geen diploma behaald

VRAAG 21: WERK

Welke van de onderstaande beschrijvingen is het meest op u van toepassing? (U kunt hier slechts één keuze maken)

☐

Ik ben zelfstandig ondernemer

☐

werkloos/werkzoekende/bijstand

☐

Ik ben in loondienst maar niet voor de overheid

☐

ik ben met de VUT, (pre)pensioen of rentenierend

☐

ik ben werkzaam voor de overheid

☐

ik ben student/schoolgaand

☐

ik ben arbeidsongeschikt

☐

Anders

☐

ik ben huisman/huisvrouw

☐

Wil ik niet zeggen

VRAAG 22: BEROEP

Welke van de onderstaande beschrijvingen past het beste bij uw huidige beroep of functie? (U kunt hier slechts *één* keuze maken)

☐ Algemeen directeur/managementfunctie	☐ Onderwijs en onderzoek
☐ Financieel/administratief	☐ Techniek
☐ Automatisering	☐ Personeel en organisatie
☐ Marketing/PR/Sales	☐ (Semi-)overheid
	☐ Verzorgend beroep (betaald)
☐ Inkoop en logistiek	☐ Adviseur/consultancy/vrije beroepen
	☐ Overige functies
	☐ Ik heb geen betaald werk
	☐ Alleen vrijwilligerswerk

HARTELIJK DANK VOOR UW DEELNAME AAN DIT ONDERZOEK

VRAGENLIJST TIJDENS WORKSHOP

Met deze vragenlijst willen we uw mening over de workshop en de groep mensen waarmee u werkt meten. Uw antwoorden maken deel uit van een groot onderzoeksproject naar de standpunten van het Nederlandse publiek over deze onderwerpen en helpen ons bij het evalueren van het proces. Het invullen van deze vragenlijst kost u ongeveer 10 minuten.

Wij danken u hartelijk voor uw medewerking

SECTIE 1: IDENTITEITSCODE

Om uw antwoorden te kunnen analyseren moeten we deze kunnen koppelen aan de vragenlijst die u eerder heeft ingevuld. In de eerste vragenlijst vroegen we u om een anonieme identificatiecode aan te maken door **de eerste twee letters van de voornaam van uw moeder of voogd(es)** in te vullen (bijv. Marie wordt **MA**), **gevolgd door de dag en maand van uw verjaardag** (bijv. als u op 2 april geboren bent, dan schrijft u hier 0204). In dit voorbeeld wordt de identificatiecode dan **MA0204**. Vul hieronder uw eigen identiteitscode in (deze moet identiek zijn aan de code die u op de vorige vragenlijst heeft ingevuld).

VUL HIER UW ID-CODE IN: ____ ____ ____ ____ ____ ____

VUL HIER UW TAFELNUMMER IN ____

SECTIE 2: DEMOGRAFIE

Om er zeker van te zijn dat onze gegevens juist zijn, vragen we u om wat informatie over uzelf in te vullen.

VRAAG 1: LEEFTIJD

Wat is uw leeftijd (in jaren)? _____

VRAAG 2: GESLACHT

Wat is uw geslacht?

☐

Man

☐

Vrouw

VRAAG 3: LOCATIE

Wat is de postcode van uw huisadres? _____

SECTIE 3: UW BEELD VAN DE MENSEN AAN UW TAFEL

In deze sectie willen wij uw beeld van de groep mensen aan uw tafel meten.

VRAAG 4: IDENTIFICATIE MET DE GROEP MENSEN AAN UW TAFEL

Zet een kruisje bij de cirkels die het best weergeven in welke mate u zich identificeert met de groep mensen aan uw tafel.

I = Ik en G = de groep aan uw tafel

The diagrams are arranged in two rows. The first row contains four diagrams: 1. Two separate circles labeled 'Ik' and 'Groep'. 2. Two overlapping circles labeled 'I' and 'G'. 3. Two overlapping circles labeled 'I' and 'G' with a different overlap. 4. Two overlapping circles labeled 'I' and 'G' with a different overlap. The second row contains three diagrams: 5. Two overlapping circles labeled 'I' and 'G'. 6. Two overlapping circles labeled 'I' and 'G' with a different overlap. 7. Two overlapping circles labeled 'I' and 'G' with a different overlap.

VRAAG 5: GEVOELENS OVER DE GROEP MENSEN AAN UW TAFEL

Omcirkel bij elke uitspraak over de groep mensen aan uw tafel het cijfer dat het meest overeenkomt met uw mening

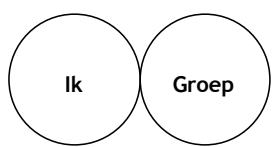
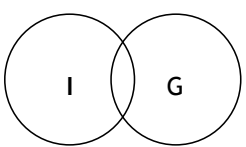
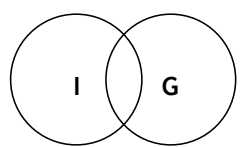
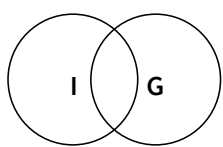
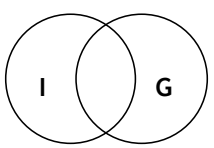
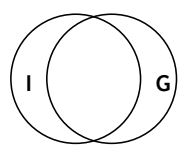
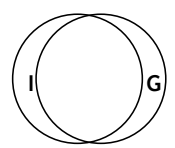
In welke mate bent u het eens of oneens met de volgende uitspraken?	Ze er mee oneens		Weet ik niet (4)				Ze er mee eens	
Ik ben blij dat ik deel uitmaak van de groep aan deze tafel	1	2	3	4	5	6	7	
Het is prettig om in de groep aan deze tafel te zitten	1	2	3	4	5	6	7	
Het geeft me een goed gevoel om deel uit te maken van deze groep	1	2	3	4	5	6	7	
Ik heb het gevoel dat ik bij deze groep hoor	1	2	3	4	5	6	7	
Ik ben blij dat ik deel uitmaak van deze groep	1	2	3	4	5	6	7	
Ik vind dat ik deel uitmaak van deze groep	1	2	3	4	5	6	7	
Ik vind dat ik belangrijke ideeën heb aangedragen in de groepsdiscussies	1	2	3	4	5	6	7	
Ik vind dat ik veel inbreng heb gehad in de groepsdiscussies	1	2	3	4	5	6	7	
We zijn een hechte groep	1	2	3	4	5	6	7	
Onze groep werkt goed samen	1	2	3	4	5	6	7	
Deze groep heeft goede discussies	1	2	3	4	5	6	7	
In deze groep hebben groepsleden de ruimte hun mening te geven	1	2	3	4	5	6	7	

SECTIE 4: BEELD VAN DE MENSEN IN DE GROTE WORKSHOP

In deze sectie willen wij uw beeld van alle mensen in de grote workshop meten.

VRAAG 6: IDENTIFICATIE MET ALLE MENSEN IN DE WORKSHOP

Zet een kruisje bij de cirkels die het best weergeven in welke mate u zich identificeert met **alle** deelnemers aan de **hele** workshop. I = Ik en G = alle deelnemers aan de workshop

			
☐	☐	☐	☐
			
☐	☐	☐	

VRAAG 7: GEVOELENS OVER ALLE MENSEN IN DE WORKSHOP

De volgende vragen gaan over de groep van alle deelnemers aan de workshop

Omcirkel bij elke uitspraak over alle deelnemers aan de workshop het cijfer dat het meest overeenkomt met uw mening

In welke mate bent u het eens of oneens met de volgende uitspraken?	Ze er mee oneens		Weet ik niet (4)				Ze er mee eens	
Ik ben blij dat ik deel uitmaak van deze workshopgroep	1	2	3	4	5	6	7	
Het is prettig om deel uit te maken van deze workshopgroep	1	2	3	4	5	6	7	
Het geeft me een goed gevoel om deel uit te maken van deze workshopgroep	1	2	3	4	5	6	7	

SECTIE 5: BEELD VAN DE EXPERTS EN DE WORKSHOPINFORMATIE

In deze sectie meten wij uw beeld van de experts en de informatie die is gegeven in de workshop.

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

VRAAG 8: VERTROUWEN IN DE WORKSHOPINFORMATIE

	Totaal niet		Gemiddeld (4)				Zeer
In welke mate vertrouwt u de informatie die in deze workshop is gegeven?	1	2	3	4	5	6	7

VRAAG 9: VERTROUWEN IN DE EXPERT DIE VERTELD HEEFT OVER KLIMAATVERANDERING EN ENERGIETECHNOLOGIEËN (TON VAN DRIL)

Geef hier uw mening over de expert die verteld heeft over klimaatverandering en energietechnologieën (Ton van Dril)							
	Totaal niet		Gemiddeld (4)				Zeer
In welke mate vindt u deze expert betrouwbaar?	1	2	3	4	5	6	7
In welke mate vertrouwt u de informatie die door deze expert is gegeven?	1	2	3	4	5	6	7
In welke mate vindt u deze expert eerlijk?	1	2	3	4	5	6	7
In welke mate vindt u dat deze expert de waarheid spreekt?	1	2	3	4	5	6	7
	Totaal mee oneens		Neutraal (4)				Totaal mee eens
Deze expert heeft veel kennis over klimaatverandering en energietechnologieën	1	2	3	4	5	6	7
Deze expert kon aantonen dat hij relevante kennis heeft	1	2	3	4	5	6	7

VRAAG 10: VERTROUWEN IN DE EXPERT DIE HEEFT VERTELD OVER CO₂-AFVANG EN -OPSLAG (MARC KOMBRINK)

Geef hier uw mening over de expert die verteld heeft over CO ₂ -afvang en -opslag (Marc Kombrink):							
	Totaal niet		Gemiddeld (4)				Zeer
In welke mate vindt u deze expert betrouwbaar?	1	2	3	4	5	6	7
In welke mate vertrouwt u de informatie die door deze expert is gegeven?	1	2	3	4	5	6	7
In welke mate vindt u deze expert eerlijk?	1	2	3	4	5	6	7
In welke mate vindt u dat deze expert de waarheid spreekt?	1	2	3	4	5	6	7
	Totaal mee oneens		Neutraal (4)				Totaal mee eens
Deze expert heeft veel kennis over klimaatverandering en emissiearme technologieën	1	2	3	4	5	6	7
Deze expert kon aantonen dat hij relevante kennis heeft	1	2	3	4	5	6	7

VRAAG 11: OPVATTINGEN OVER KLIMAATVERANDERING EN BIJBEHORENDE ZAKEN

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

In welke mate bent u het eens of oneens met de volgende uitspraken?	Zeet mee oneens		Weet ik niet (4)				Zeet mee eens	
Klimaatverandering is een belangrijk probleem voor Nederland	1	2	3	4	5	6	7	
De elektriciteitsproductie levert een grote bijdrage aan broeikasgasemissies	1	2	3	4	5	6	7	
De industrie zou meer moeten doen om broeikasgasemissies te beperken	1	2	3	4	5	6	7	
Mensen zouden meer moeten doen om energiebesparing thuis te bevorderen	1	2	3	4	5	6	7	
De overheid zou meer moeten doen om broeikasgasemissies te beperken	1	2	3	4	5	6	7	
Mensen zouden meer moeten doen om energiebesparing op de werkplek te bevorderen	1	2	3	4	5	6	7	
Het verhogen van de elektriciteitsprijs helpt om broeikasgasemissies te beperken	1	2	3	4	5	6	7	

VRAAG 12: MENINGEN OVER ENERGIEBRONNEN EN BIJHORENDE TECHNOLOGIEËN

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

In welke mate bent u het eens of oneens met de toepassing van de volgende energiebronnen/technologieën?	Zeet mee oneens		Weet ik niet (4)				Zeet mee eens	
Windenergie	1	2	3	4	5	6	7	
CO ₂ -afvang en -opslag (CCS)	1	2	3	4	5	6	7	
Nucleaire energie	1	2	3	4	5	6	7	
Hydro-elektriciteit (elektriciteit uit waterkracht)	1	2	3	4	5	6	7	
Kolenverbranding (traditionele/huidige methoden)	1	2	3	4	5	6	7	
Aardgas	1	2	3	4	5	6	7	
Geothermische energie (aardwarmte)	1	2	3	4	5	6	7	
Zonne-energie	1	2	3	4	5	6	7	
Biobrandstoffen	1	2	3	4	5	6	7	
Olie	1	2	3	4	5	6	7	
Golfslag-/getijdenenergie	1	2	3	4	5	6	7	
Gaswinning uit kolen	1	2	3	4	5	6	7	

HARTELIJK DANK VOOR UW DEELNAME AAN DIT ONDERZOEK

VRAGENLIJST NA AFLOOP VAN DE WORKSHOP

Met deze vragenlijst willen we een aantal van uw standpunten over klimaatverandering en energie meten. Uw antwoorden maken deel uit van een groot onderzoeksproject naar de standpunten van het Nederlandse publiek over deze onderwerpen. Het invullen van deze vragenlijst kost ongeveer 20 minuten.

Wij danken u hartelijk voor uw medewerking

SECTIE 1: IDENTITEITSCODE

Om uw antwoorden te kunnen analyseren moeten we deze kunnen koppelen aan de vragenlijsten die u eerder heeft ingevuld. In de voorafgaande vragenlijsten vroegen we u om een anonieme identificatiecode aan te maken door **de eerste twee letters van de voornaam van uw moeder of voogdes** in te vullen (bijv. Marie wordt MA), **gevolgd door de dag en maand van uw verjaardag** (bijv. als u op 2 april geboren bent, dan schrijft u hier 0204). In dit voorbeeld wordt de identificatiecode dan **MA0204**. Vult u hieronder uw eigen identiteitscode in (deze moet identiek zijn aan de code die u op de vragenlijst voorafgaand aan de workshop heeft ingevuld).

VULT HIER UW ID-CODE IN: ____ ____ ____ ____ ____ ____

VUL HIER UW TAFELNUMMER IN ____

SECTIE 2: DEMOGRAFIE

Om er zeker van te zijn dat onze gegevens juist zijn vragen we u om wat informatie over uzelf in te vullen.

VRAAG 1: LEEFTIJD

Wat is uw leeftijd (in jaren)? _____

VRAAG 2: GESLACHT

Wat is uw geslacht?

☐

Man

☐

Vrouw

VRAAG 3: LOCATIE

Wat is de postcode van uw huisadres? _____

SECTIE 3: KENNIS

Deze sectie gaat over uw bewustzijn van en kennis over klimaatverandering, energiebronnen, energietechnologieën en andere bijbehorende zaken.

VRAAG 4: KENNIS OVER KLIMAATVERANDERING EN BIJBEHORENDE ZAKEN

Omcirkel bij elk onderwerp het cijfer dat het meest overeenkomt met uw kennis over de volgende onderwerpen.

Hoeveel kennis heeft u van de volgende onderwerpen?	Geen kennis		Gemiddelde kennis				Veel kennis	
Klimaatverandering	1	2	3	4	5	6	7	
Broeikasgasemissies	1	2	3	4	5	6	7	
Methoden voor elektriciteitsproductie	1	2	3	4	5	6	7	
Gebruik van fossiele brandstoffen	1	2	3	4	5	6	7	
Initiatieven van de overheid om broeikasgasemissies te verminderen	1	2	3	4	5	6	7	
Elektriciteitsbesparing thuis	1	2	3	4	5	6	7	
Initiatieven van de industrie om broeikasgasemissies te verminderen	1	2	3	4	5	6	7	
Elektriciteitsbesparing op de werkplek	1	2	3	4	5	6	7	
De relatie tussen de elektriciteitsprijs en broeikasgasemissies	1	2	3	4	5	6	7	

VRAAG 5: KENNIS VAN ENERGIEBRONNEN EN ENERGIETECHNOLOGIEËN

Omcirkel bij elk onderwerp het cijfer dat het meest overeenkomt met uw kennis over de volgende onderwerpen.

Hoeveel kennis heeft u van de volgende onderwerpen?	Geen kennis		Gemiddelde kennis				Veel kennis	
Windenergie	1	2	3	4	5	6	7	
CO ₂ -afvang en -opslag (CCS)	1	2	3	4	5	6	7	
Nucleaire energie	1	2	3	4	5	6	7	
Hydro-elektriciteit (elektriciteit uit waterkracht)	1	2	3	4	5	6	7	
Kolenverbranding (traditionele/huidige methoden)	1	2	3	4	5	6	7	
Aardgas	1	2	3	4	5	6	7	
Geothermische energie (aardwarmte)	1	2	3	4	5	6	7	
Zonne-energie	1	2	3	4	5	6	7	
Biobrandstoffen	1	2	3	4	5	6	7	
Olie	1	2	3	4	5	6	7	
Golfslag-/getijdenenergie	1	2	3	4	5	6	7	
Gaswinning uit kolen	1	2	3	4	5	6	7	

SECTIE 4: MENINGEN

In deze sectie willen we uw mening meten over klimaatverandering, energiebronnen, energietechnologieën en andere bijbehorende zaken.

VRAAG 6: OPVATTINGEN OVER KLIMAATVERANDERING EN BIJBEHORENDE ZAKEN

Omcirkel bij elke uitspraak het cijfer dat meest overeenkomt met uw mening.

In welke mate bent u het eens of oneens met de volgende uitspraken?	Zeet mee oneens		Weet ik niet (4)				Zeet mee eens	
Klimaatverandering is een belangrijk probleem voor Nederland	1	2	3	4	5	6	7	
De elektriciteitsproductie levert een grote bijdrage aan broeikasgasemissies	1	2	3	4	5	6	7	
De industrie zou meer moeten doen om broeikasgasemissies te beperken	1	2	3	4	5	6	7	
Mensen zouden meer moeten doen om energiebesparing thuis te bevorderen	1	2	3	4	5	6	7	
De overheid zou meer moeten doen om broeikasgasemissies te beperken	1	2	3	4	5	6	7	
Mensen zouden meer moeten doen om energiebesparing op de werkplek te bevorderen	1	2	3	4	5	6	7	
Het verhogen van de elektriciteitsprijs helpt om broeikasgasemissies te beperken	1	2	3	4	5	6	7	

VRAAG 7: OPVATTINGEN OVER ENERGIEBRONNEN EN ENERGIETECHNOLOGIEËN

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

In welke mate bent u het eens of oneens met de toepassing van de volgende energiebronnen/technologieën?	Zeet mee oneens		Weet ik niet (4)				Zeet mee eens	
Windenergie	1	2	3	4	5	6	7	
CO ₂ -afvang en -opslag (CCS)	1	2	3	4	5	6	7	
Nucleaire energie	1	2	3	4	5	6	7	
Hydro-elektriciteit (elektriciteit uit waterkracht)	1	2	3	4	5	6	7	
Kolenverbranding (traditionele/huidige methoden)	1	2	3	4	5	6	7	
Aardgas	1	2	3	4	5	6	7	
Geothermische energie (aardwarmte)	1	2	3	4	5	6	7	
Zonne-energie	1	2	3	4	5	6	7	
Biobrandstoffen	1	2	3	4	5	6	7	
Olie	1	2	3	4	5	6	7	
Golfslag-/getijdenenergie	1	2	3	4	5	6	7	
Gaswinning uit kolen	1	2	3	4	5	6	7	

VRAAG 8: BEPALING VAN RANGORDE VAN ENERGIEBRONNEN EN AANVERWANTE TECHNOLOGIEËN

Als u geld zou mogen toewijzen aan de ontwikkeling en invoering van onderstaande energiebronnen en energietechnologieën, waaraan zou u dan het meeste uitgeven en waaraan het minste? Geef de volgorde (rangorde) aan waarin u onderstaande energiebronnen en energietechnologieën zou plaatsen als u geld zou mogen toewijzen aan hun ontwikkeling en invoering, waarbij 1 (één) de hoogste prioriteit weergeeft en 12 (twaalf) de laagste prioriteit. NB: U mag de cijfers 1 t/m 12 elk maar één keer gebruiken.

Energiebronnen en aanverwante technologieën	Prioriteits-rangorde voor financiering
Windenergie	
CO ₂ -afvang en -opslag (CCS)	
Nucleaire energie	
Hydro-elektriciteit (elektriciteit uit waterkracht)	
Kolenverbranding (traditionele/huidige methoden)	
Aardgas	
Geothermische energie (aardwarmte)	
Zonne-energie	
Biobrandstoffen	
Olie	
Golfslag-/getijdenenergie	
Gaswinning uit kolen	

SECTIE 5: TOEKOMSTIG GEDRAG

In deze sectie willen we diverse aspecten van uw bedoelingen meten.

VRAAG 9: VOORNEMEN OM GEDRAG TE VERANDEREN

Hieronder vindt u een lijst met gedragingen die betrekking hebben op het milieu. *Omcirkel* bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

Dankzij deelname aan deze workshop zal ik:	Zeet mee oneens		Weet ik niet (4)				Zeet mee eens	
Kiezen voor 'groene' elektriciteit en/of 'groen' gas als ik deze keuze krijg	1	2	3	4	5	6	7	
Extra betalen voor 'groene' elektriciteit of 'groen' gas	1	2	3	4	5	6	7	
Mijn afval recyclen (bijv. blik, glas, papier)	1	2	3	4	5	6	7	
Naar het energielabel kijken als ik witgoed koop (bijv. wasmachine, droger, koelkast)	1	2	3	4	5	6	7	
Zelf meegebrachte tassen gebruiken bij het winkelen	1	2	3	4	5	6	7	
Thuis een systeem voor warm water uit zonne-energie (zonneboiler) installeren	1	2	3	4	5	6	7	
Spaarlampen gebruiken	1	2	3	4	5	6	7	
Besparen op mijn elektriciteitsgebruik thuis	1	2	3	4	5	6	7	
Besparen op mijn elektriciteitsgebruik op mijn werkplek	1	2	3	4	5	6	7	
Doorgaan met mijn huidige gedrag aangezien ik het meeste van bovenstaande al doe	1	2	3	4	5	6	7	

VRAAG 10: BEREIDHEID OM MEER TE BETALEN VOOR ELEKTRICITEIT

Zou u bereid zijn meer te betalen voor elektriciteit voor uw huishouden als daarmee broeikasgasemissies worden verminderd? Zet een *kruis bij 'ja' of 'nee'* om uw mening aan te geven:

☐ Nee (Ga naar Vraag 11)

☐ Ja (Gaat u hieronder verder)

Indien u heeft geantwoord met 'ja', welke van onderstaande mogelijkheden geeft het beste aan hoeveel meer u bereid zou zijn te betalen voor elektriciteit voor uw huishouden als daarmee broeikasgasemissies worden verminderd? (Kruis slechts *één vakje* aan)

Ik zou minder dan €20 per kwartaal betalen

☐ Geef het bedrag per kwartaal in euros aan: €_____.

☐ Ik zou tot €20 euro meer betalen per kwartaal (ongeveer €2 per week)

☐ Ik zou tot €40 euro meer betalen per kwartaal (ongeveer €4 per week)

☐ Ik zou tot €60 euro meer betalen per kwartaal (ongeveer €6 per week)

☐ Ik zou tot €80 euro meer betalen per kwartaal (ongeveer €8 per week)

☐ Ik zou tot €120 euro meer betalen per kwartaal (ongeveer €12 per week)

Ik zou meer dan €120 per kwartaal betalen.

☐ Geef het bedrag per kwartaal in euros aan: €_____.

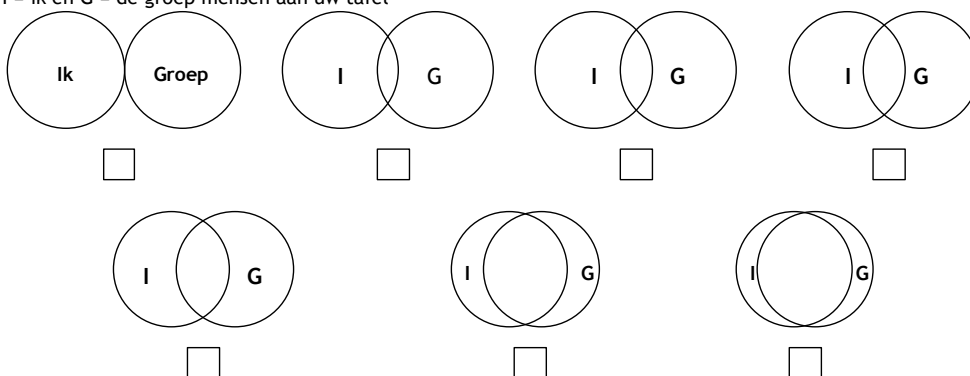
SECTIE 6: UW BEELD VAN DE MENSEN AAN UW TAFEL

In deze sectie willen wij uw beeld van de groep mensen aan uw tafel meten.

VRAAG 11: IDENTIFICATIE MET DE GROEP MENSEN AAN UW TAFEL

Zet een kruisje bij de cirkels die het best weergeven in welke mate u zich identificeert met **de groep mensen aan uw tafel**.

I = ik en G = de groep mensen aan uw tafel



VRAAG 12: GEVOELENS OVER DE GROEP MENSEN AAN UW TAFEL

Omcirkel bij elke uitspraak over de groep mensen aan uw tafel het cijfer dat het meest overeenkomt met uw mening

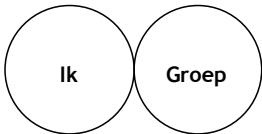
In welke mate bent u het eens of oneens met de volgende uitspraken?	Zeet mee oneens		Weet ik niet (4)				Zeet mee eens	
Ik ben blij dat ik deel uitmaak van de groep aan deze tafel	1	2	3	4	5	6	7	
Het is prettig om deel te zijn van de groep aan deze tafel	1	2	3	4	5	6	7	
Het geeft me een goed gevoel om deel uit te maken van deze groep	1	2	3	4	5	6	7	
Ik heb het gevoel dat ik bij deze groep hoor	1	2	3	4	5	6	7	
Ik ben blij dat ik deel uitmaak van deze groep	1	2	3	4	5	6	7	
Ik vind dat ik deel uitmaak van deze groep	1	2	3	4	5	6	7	
Ik vind dat ik belangrijke ideeën heb aangedragen in de groepsdiscussies	1	2	3	4	5	6	7	
Ik vind dat ik veel inbreng heb gehad in de groepsdiscussies	1	2	3	4	5	6	7	
We zijn een hechte groep	1	2	3	4	5	6	7	
Onze groep werkt goed samen	1	2	3	4	5	6	7	
Deze groep heeft goede discussies	1	2	3	4	5	6	7	
In deze groep hebben groepsleden de ruimte hun mening te geven	1	2	3	4	5	6	7	

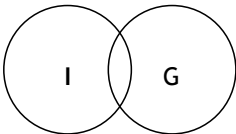
SECTIE 7: BEELD VAN DE MENSEN IN DE GROTE WORKSHOP

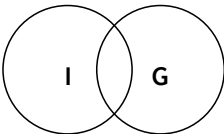
In deze sectie willen wij uw beeld van alle mensen in de grote workshop meten.

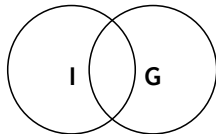
VRAAG 13: IDENTIFICATIE MET ALLE MENSEN IN DE GROTE WORKSHOP

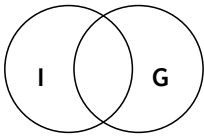
Zet een kruisje bij de cirkels die het best weergeven in welke mate u zich identificeert met **alle deelnemers** aan de **hele workshop**. I = Ik en G = de groep mensen in de grote workshop

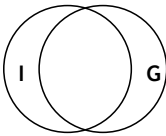

☐

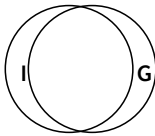

☐


☐


☐


☐


☐


☐

VRAAG 14: GEVOELENS OVER ALLE IN DE WORKSHOP

De volgende vragen gaan over de groep van alle deelnemers in de workshop

Omcirkel bij elke uitspraak over alle deelnemers aan de workshop het cijfer dat het meest overeenkomt met uw mening

In welke mate bent u het eens of oneens met de volgende uitspraken?	Zeet mee oneens		Weet ik niet (4)				Zeet mee eens	
Ik ben blij dat ik deel uitmaak van deze workshopgroep	1	2	3	4	5	6	7	
Het is prettig om deel uit te maken van deze workshopgroep	1	2	3	4	5	6	7	
Het geeft me een goed gevoel om deel uit te maken van deze workshopgroep	1	2	3	4	5	6	7	

SECTIE 8: BEELD VAN DE EXPERTS EN DE WORKSHOPINFORMATIE

In deze sectie meten wij uw beeld van de experts en de informatie die is gegeven in de workshop.

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

VRAAG 15: VERTROUWEN IN DE WORKSHOPINFORMATIE

	Totaal niet		Gemiddeld (4)				Zeet veel	
In welke mate vertrouwt u de informatie die in deze workshop is gegeven?	1	2	3	4	5	6	7	

VRAAG 16: VERTROUWEN IN DE EXPERT DIE VERTELD HEEFT OVER KLIMAATVERANDERING EN ENERGIETECHNOLOGIEËN (Ton van Dril)

Geef hier uw mening over de expert die verteld heeft over klimaatverandering en energietechnologieën (Ton van Dril)	Totaal niet		Gemiddeld (4)				Zeet	
In welke mate vindt u deze expert betrouwbaar?	1	2	3	4	5	6	7	
In welke mate vertrouwt u de informatie die door deze expert is gegeven?	1	2	3	4	5	6	7	
In welke mate vindt u deze expert eerlijk?	1	2	3	4	5	6	7	
In welke mate vindt u dat deze expert de waarheid spreekt?	1	2	3	4	5	6	7	
	Totaal mee oneens		Neutraal (4)				Totaal mee eens	
Deze expert heeft veel kennis over klimaatverandering en energietechnologieën	1	2	3	4	5	6	7	
Deze expert kon aantonen dat hij relevante kennis heeft	1	2	3	4	5	6	7	

VRAAG 17: VERTROUWEN IN DE EXPERT DIE HEEFT VERTELD OVER CO₂-AFVANG EN -OPSLAG (MARC KOMBRINK)

Geef hier uw mening over de expert die heeft verteld over CO ₂ -afvang en -opslag (Marc Kombrink):	Totaal niet		Gemiddeld (4)				Zeer
In welke mate vindt u deze expert betrouwbaar?	1	2	3	4	5	6	7
In welke mate vertrouwt u de informatie die door deze expert is gegeven?	1	2	3	4	5	6	7
In welke mate vindt u deze expert eerlijk?	1	2	3	4	5	6	7
In welke mate vindt u dat deze expert de waarheid spreekt?	1	2	3	4	5	6	7
	Totaal mee oneens		Neutraal (4)				Totaal mee eens
Deze expert heeft veel kennis over klimaatverandering en emissiearme technologieën	1	2	3	4	5	6	7
Deze expert kon aantonen dat hij relevante kennis heeft	1	2	3	4	5	6	7

SECTIE: EERLIJKHEID VAN DEZE WORKSHOP

In deze sectie willen wij uw opvattingen over de workshop meten.

VRAAG 18 : EERLIJKHEID VAN DEZE WORKSHOP

We willen graag horen wat uw opvattingen zijn over het verloop van de workshop. *Omcirkel* bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

In welke mate:	Beperkte mate		Gemiddelde mate (4)				Grote mate
Heeft u uw meningen en gevoel kunnen uiten tijdens de workshop?	1	2	3	4	5	6	7
Heeft u invloed gehad op de resultaten (bijv. samenvatting van belangrijkste punten) van de workshop?	1	2	3	4	5	6	7
Heeft u feedback kunnen geven over de resultaten die tijdens de workshop behaald zijn?	1	2	3	4	5	6	7
Geven de resultaten van de workshop weer hoeveel moeite u erin heeft gestoken?	1	2	3	4	5	6	7
Waren de resultaten van de workshop passend met uw bijdrage?	1	2	3	4	5	6	7
Gaven de workshopresultaten uw bijdrage weer?	1	2	3	4	5	6	7
Bent u beleefd behandeld?	1	2	3	4	5	6	7
Bent u met waardigheid behandeld?	1	2	3	4	5	6	7
Bent u met respect behandeld?	1	2	3	4	5	6	7
Was de communicatie tijdens de workshop eerlijk?	1	2	3	4	5	6	7
Was het workshopproces grondig uitgelegd?	1	2	3	4	5	6	7
Was de uitleg over het workshopproces redelijk?	1	2	3	4	5	6	7

SECTIE 10: WORKSHOPEVALUATIE

Met deze vragen willen we uw standpunten ten aanzien van de workshop meten. Dit helpt ons bij de voortdurende verbetering van ons onderzoeksproces.

VRAAG 19: WORKSHOPACTIVITEITEN

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

Is uw begrip door onderstaande aspecten verbeterd?	Ze er mee oneens		Weet ik niet (4)				Ze er mee eens	
De presentaties	1	2	3	4	5	6	7	
De mogelijkheid om vragen te stellen	1	2	3	4	5	6	7	
De discussies	1	2	3	4	5	6	7	
Alle informatie en activiteiten	1	2	3	4	5	6	7	

VRAAG 20 : ASPECTEN VAN DEZE WORKSHOP

Omcirkel bij elke uitspraak het cijfer dat het meest overeenkomt met uw mening.

In welke mate bent u het eens of oneens met de volgende uitspraken?	Ze er mee oneens		Weet ik niet (4)				Ze er mee eens	
De locatie was geschikt	1	2	3	4	5	6	7	
Ik zal de overhandigde informatie lezen	1	2	3	4	5	6	7	
De workshop was informatief	1	2	3	4	5	6	7	
De gastheer van de workshop was makkelijk te begrijpen	1	2	3	4	5	6	7	
De lengte van de workshop was goed	1	2	3	4	5	6	7	
Het eten was uitstekend	1	2	3	4	5	6	7	
De activiteiten waren aangenaam	1	2	3	4	5	6	7	

VRAAG 21: DOEL VAN DE WORKSHOP

Zet hieronder een *kruisje* in de vakjes die het meest overeenkomen met uw mening over het doel van deze workshop

☐ Overtuigen	☐ Informeren
☐ Betrekken	☐ Toegang krijgen tot mijn meningen
☐ Beïnvloeden	☐ Andere doelen (geef aan) _____
☐ Raadplegen	_____

Appendix B Statistical tables

Table B.1 *Environmental beliefs*

How strongly do you believe the following? ¹	Mean	Std. Deviation
We are approaching the limit of the number of people the earth can support	4,6	1,6
Humans have the right to modify the natural environment to suit their needs ²	4,0	1,6
When humans interfere with nature it often produces disastrous consequences	4,9	1,5
Human ingenuity will make sure that we do NOT make the earth unliveable ²	3,7	1,4
Humans are severely abusing the environment	5,1	1,3
The earth has plenty of natural resources if we just learn how to develop them ²	3,1	1,6
Plants and animals have as much right as humans to exist	6,1	1,2
The balance of nature is strong enough to cope with the impacts of modern industrial nations ²	4,8	1,4
Despite all our special abilities humans are still subject to the laws of nature	6,0	1,0
The so-called "ecological crisis" facing humankind has been greatly exaggerated ²	4,3	1,5
The earth is like a spaceship with very limited room and resources	4,8	1,6
Humans were meant to rule over the rest of nature ²	4,7	1,8
The balance of nature is very delicate and easily upset	5,4	1,2
Humans will eventually learn enough about how nature works to be able to control it ²	4,3	1,5
If things continue on their present course, we will soon experience a major ecological catastrophe	4,9	1,5

¹: Pro-environmental beliefs were measured on a scale of 1-strongly disagree, 4-unsure, 7-strongly agree.

²: These items are reverse scored.

Table B.2 *Environmental behaviours*

Circled 'yes':	Frequency	Percentage
I chose 'green' electricity and/or 'green gas' when the choice was offered	65	59.6
I pay extra for 'green' electricity or 'green' gas	79	73.1
I recycle my garbage (e.g. cans, bottles, newspapers)	97	89.0
I consider energy efficiency ratings when purchasing white goods	94	85.5
I bring my own bags from home when shopping	93	85.3
I have a solar hot water system in my home	5	4.5
I use energy efficient light bulbs	96	88.1
I conserve my use of electricity in the home	99	90.8
I conserve my use of electricity in the workplace	60	56.6

Table B.3 *Knowledge of energy and the environment*

	Percentage		
Is each of the following statements true or false?	True	False	Don't know
Once the infrastructure is in place, carbon capture and storage will reduce emissions from coal-fired power at no additional costs, other than maintenance	15	28*	57
Climate change can completely be explained through natural variability in climatic cycles	29	47*	24

	Percentage		
The greenhouse effect is caused by a hole in the earth's atmosphere	51	39*	10
Generating electricity from renewable energy costs less than generating electricity from coal	33	25*	41
Embodied energy is the energy used to produce and transport the goods and services we buy	19*	14	67
The Netherlands uses less water per person than any country in Europe (including industrial, agricultural, and domestic water use)	20	35*	45
About half of Dutch carbon emissions come from electricity generation	28	18*	54
Recycling paper, cardboard, metals, and glass saves on materials, but does not help in saving water, energy, or fuel	56	29*	15

Note: correct answers are marked *

Table B.4 *Mean changes in knowledge of climate change and related issues*

	Mean score	
How would you rate your knowledge of the following?	Pre	Post
Electricity conservation in the home *	5.4	5.7
Electricity conservation in the workplace *	4.3	4.9
Methods of electricity production *	4.1	5.0
Climate change *	4.0	4.9
Use of fossil fuels *	3.9	4.8
Government initiatives to reduce greenhouse gas emissions *	3.1	4.2
Industry initiatives to reduce greenhouse gas emissions *	3.0	4.2
Greenhouse gas emissions *	3.0	4.6
The relationship between the price of electricity and greenhouse gas emissions *	2.6	3.9

Note: Knowledge was measured as (1) no knowledge, (4) moderate knowledge, (7) high knowledge.

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

Table B.5 *Mean changes in knowledge of energy sources and related technologies*

	Mean score	
How would you rate your knowledge of the following?	Pre	Post
Solar *	4.4	5.4
Wind *	4.2	4.9
Natural Gas *	3.9	4.9
Oil *	3.9	4.6
Coal (traditional/current) *	3.7	4.5
Biofuels *	3.7	4.5
Hydro-electric *	3.5	4.2
Nuclear *	3.4	4.2
Coal (seam gas) *	2.9	4.2
Carbon Capture and Storage (CCS) *	2.9	4.8
Geothermal (hot rocks) *	2.8	4.2
Wave/tidal *	2.7	3.9

Note: Knowledge was measured as (1) no knowledge, (4) moderate knowledge, (7) high knowledge.

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

Table B.6 *Mean changes in attitude toward climate change and related issues*

	Mean score	
	Pre	Post
How strongly do you agree with the following?		
People should be doing more to promote electricity conservation in the home *	5.9	5.7
People should be doing more to promote electricity conservation in the workplace	5.7	5.7
Climate change is an important issue for the Netherlands	5.6	5.5
Government should be doing more to reduce greenhouse gas emissions *	5.6	6.0
Industry should be doing more to reduce greenhouse gas emissions *	5.5	5.9
The production of electricity is a major contributor to greenhouse gas emissions *	4.9	5.2
Increasing the price of electricity to help reduce greenhouse gas emissions *	3.0	3.4

Note: Attitude was measured as (1) strongly disagree, (4) unsure, (7) strongly agree.

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

Table B.7 *Mean changes in attitude to energy sources and related technologies*

	Mean score	
	Pre	Post
How strongly do you support the use of the following?		
Solar	6.6	6.5
Wind	6.2	6.2
Hydro-electric *	6.0	5.5
Geothermal (hot rocks)	5.5	5.5
Wave/tidal *	5.4	5.1
Biofuels *	5.2	4.8
Natural Gas	4.7	4.9
Carbon Capture and Storage (CCS) *	4.2	3.7
Oil *	3.9	4.2
Nuclear	3.7	3.8
Coal seam gas	3.5	3.7
Coal (traditional/current methods)	3.5	3.6

Note: Attitude was measured as (1) strongly disagree, (4) unsure, (7) strongly agree.

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

Table B.8 *Changes in the mean priority of preferred energy technology*

	Mean score	
	Pre	Post
Funding priority order		
Coal (traditional/current methods)	9.2	9.2
Coal seam gas	8.9	9.4
Nuclear *	8.6	7.9
Oil	8.2	8.0
Carbon Capture and Storage (CCS)	7.8	8.5
Natural Gas *	6.9	6.1
Biofuels *	5.9	6.6
Geothermal (hot rocks)	5.8	5.6
Wave/tidal	5.7	6.1
Hydro-electric	4.8	5.0
Wind	3.0	3.0
Solar	2.7	2.3

Note: Priority was measured from 1=highest priority to 12=lowest priority

* indicates a significant ($p < 0.05$) difference between pre- and post-workshop responses in a paired t-test.

Table B.9 *Intended behaviour as a result of the workshop*

As a result of this workshop I will:	Mean score	Std. Deviation
Continue with my current behaviour as I already practice most of the behaviours above	6.07	1.247
Use plastic bags when shopping	5.94	1.467
Consider energy efficiency ratings when purchasing white goods	5.91	1.443
Use energy efficient light bulbs	5.89	1.523
Conserve my use of electricity in the home	5.88	1.545
Recycle my garbage (e.g. cans, bottles, newspapers)	5.69	1.603
Conserve my use of electricity in the workplace	5.28	1.693
Opt for 'green' electricity of 'green' gas when given the choice	4.82	1.917
Install a solar hot water system in my home	4.37	1.781
Pay extra for 'green' electricity	3.43	1.974

Note: Intentions measured as (1) strongly disagree, (4) unsure, (7) strongly agree.

Table B.10 *Mean trust in information sources*

How much do you trust the following information sources?	Mean score	Std. Deviation
Research Institutes	5.61	0.961
Academic articles	5.50	1.237
Family and friends	5.21	1.415
Books	5.00	1.210
Television news and current affairs programs	4.84	1.317
Internet sites and blog sites	4.79	1.179
Newspapers	4.75	1.221
Government correspondence e.g. mail outs	4.67	1.277
Environmental organisations	4.65	1.397
Radio	4.50	1.254
My local council	4.46	1.352
Newsletters or flyers from interest groups	4.45	1.260
Magazines	4.39	1.178
Industry	3.75	1.510
Social network sites (e.g. Hyves, Facebook, LinkedIn)	3.45	1.318

Note: Preferences measured as (1) strongly disagree, (4) unsure, (7) strongly agree.

Appendix C Presentation slides



Klimaatverandering en Energiegebruik

Ton van Dril



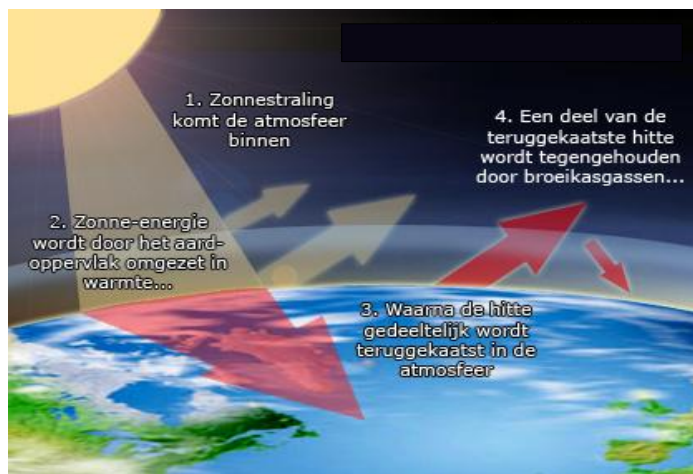
www.ecn.nl



Inhoud

- Broeikasgassen en klimaatverandering
- Energiegebruik en uitstoot broeikasgassen
 - Wereld
 - Nederland

Het broeikaseffect



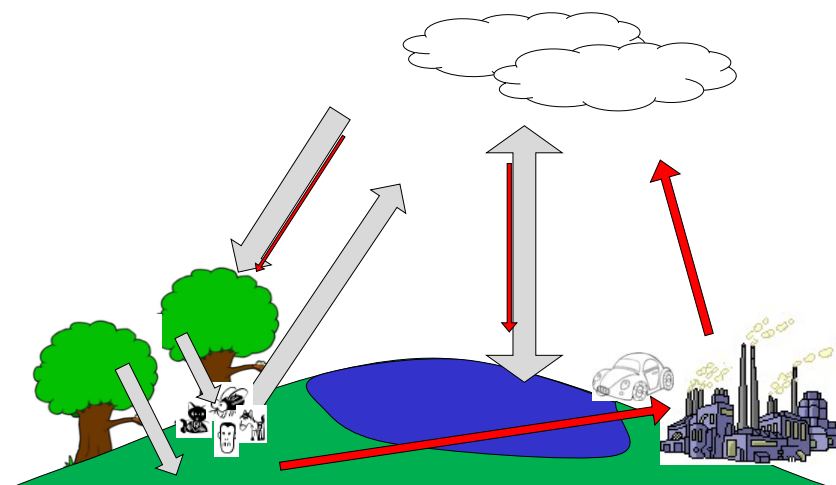
3

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Koolstofkringloop



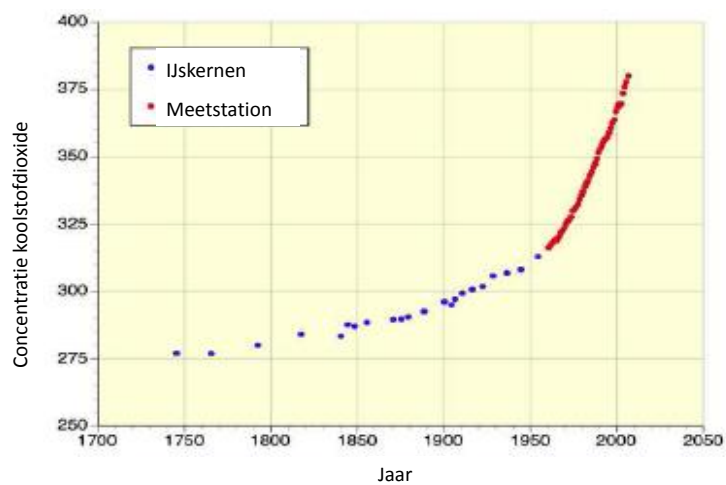
4

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Koolstofdioxide (CO₂) in de lucht



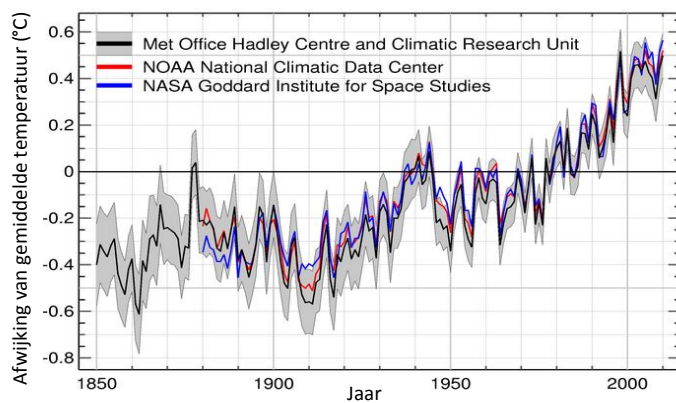
5

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Gemiddelde wereld temperatuur



6

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Wat is het effect van klimaatverandering?

- Voedselopbrengst
 - Waterbeschikbaarheid
 - Zeespiegelstijging
 - Ecosystemen
 - Extreme weersomstandigheden
- In het algemeen geldt: hoe meer temperatuursstijging, hoe groter de gevolgen

7

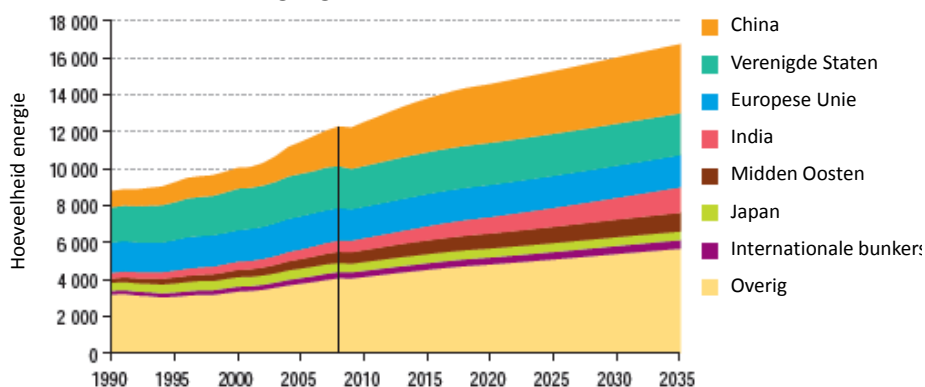
23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Hoe gaat het verder?

Energiegebruik in de wereld



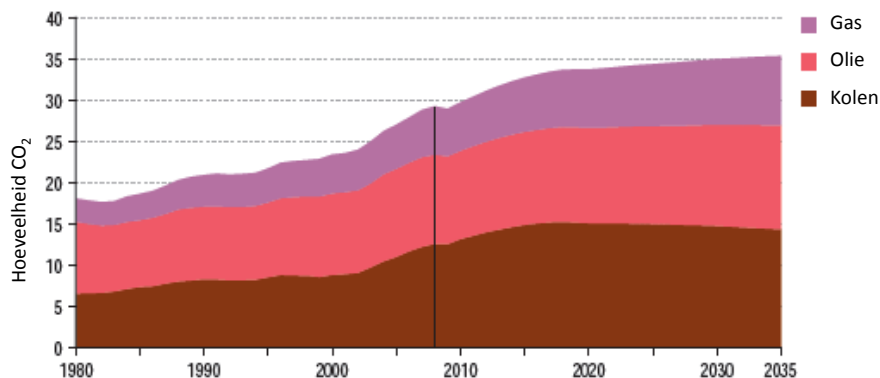
8

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Wat betekent dat voor de uitstoot van CO₂?



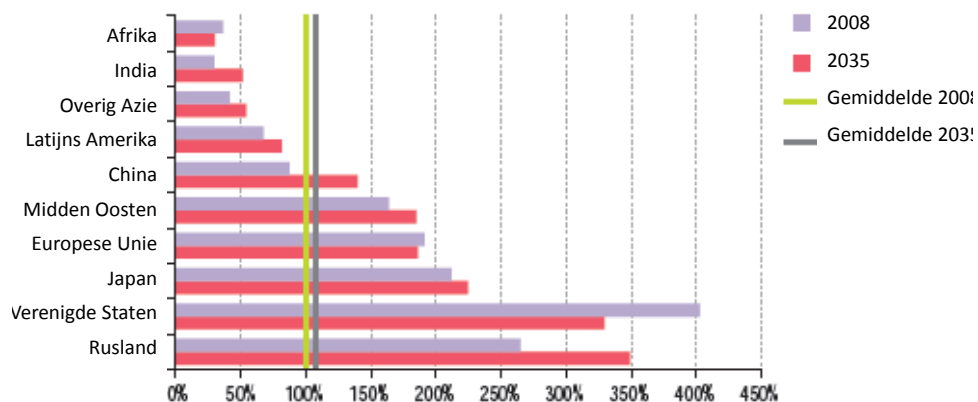
9

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Groot verschil energiegebruik per persoon



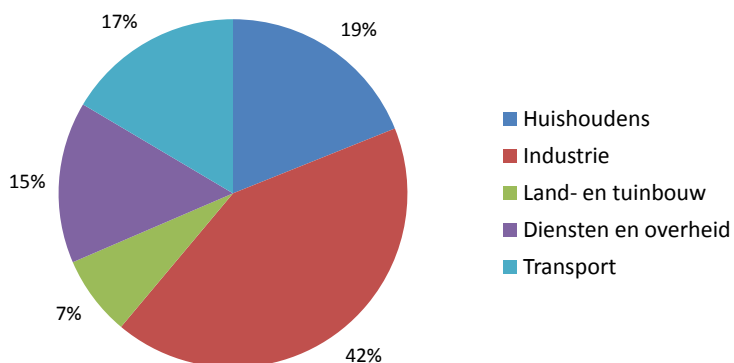
10

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Verdeling energiegebruik in NL



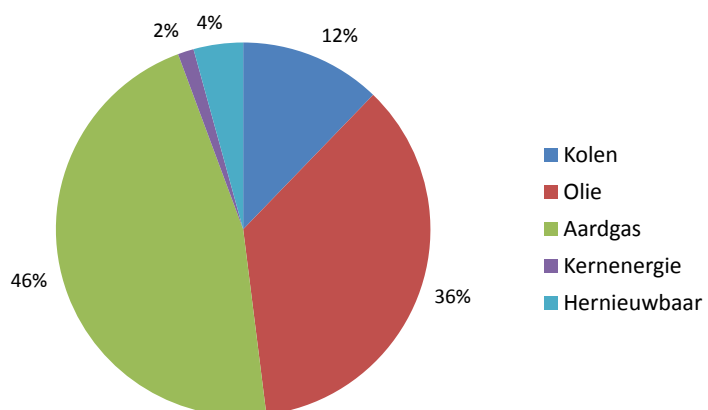
11

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Verdeling van energiedragers in NL



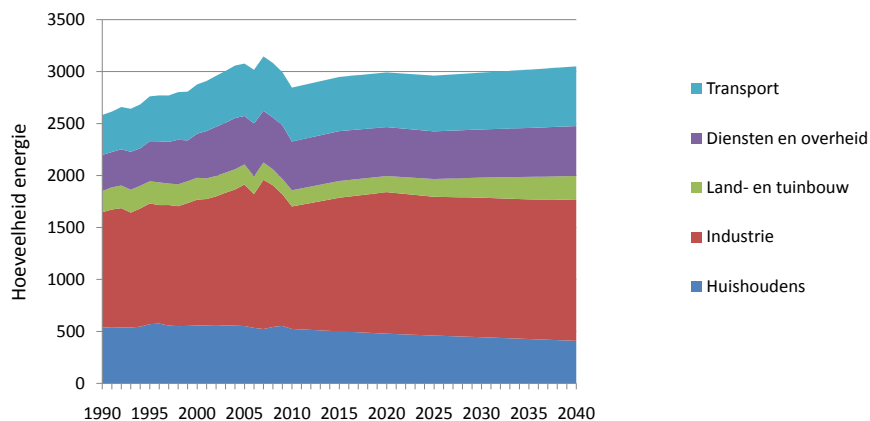
12

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Energiebruik in Nederland



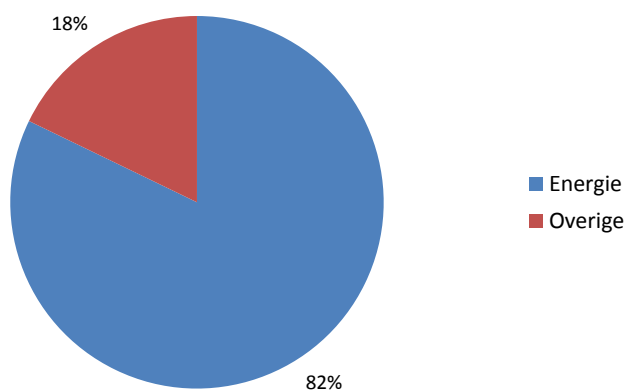
13

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Broeikasgasuitstoot in NL



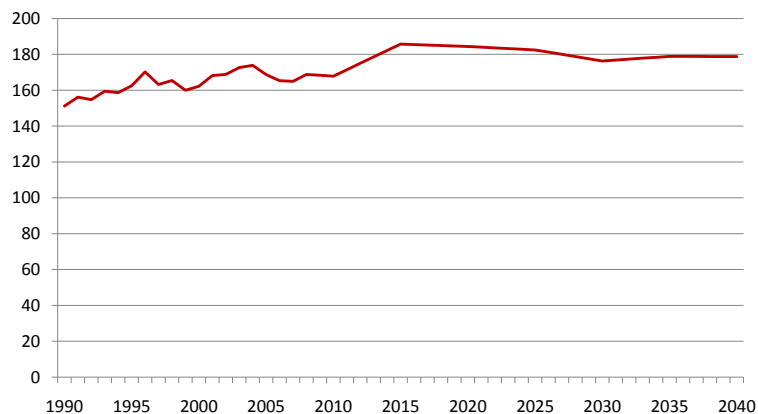
14

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

CO₂ uitstoot door energiegebruik in NL



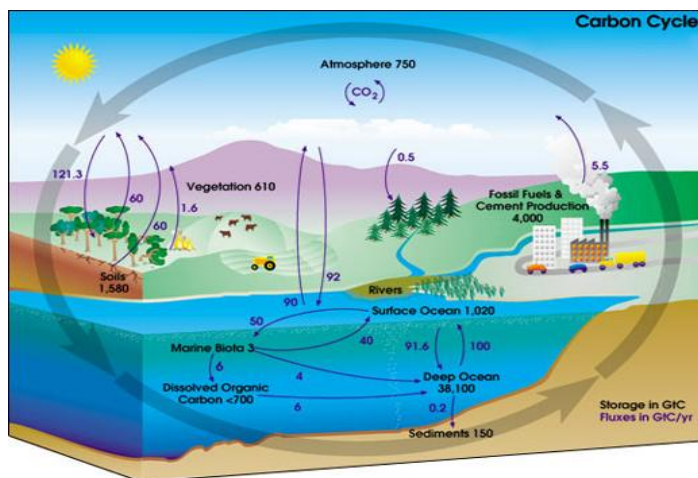
15

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Koolstofcyclus



<http://www.nasa.gov>

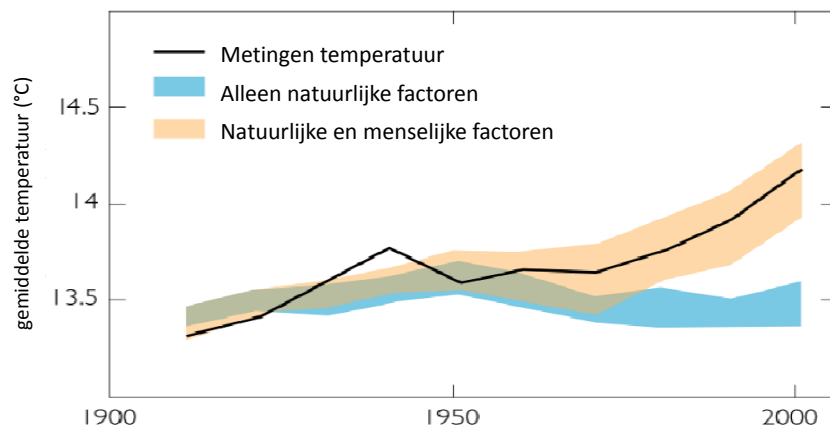
16

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Hoe wordt temperatuursverandering verklaard?



Mogelijkheden om CO₂-uitstoot te verminderen

Ton van Dril



Drie strategieën om uitstoot te verminderen

- Minder energie gebruiken:
 - Energiezuinige technieken en gedragsverandering
- Energie gebruiken die minder uitstoot veroorzaakt:
 - Hernieuwbare energie, b.v. zon, wind
 - Kernenergie
- Afvangen en opslaan van CO₂ (CCS)

Minder energie gebruiken

- Energie efficiënte technologie
 - Zuinigere auto's
 - HR ketel
 - Isolatie
 - Efficiëntere processen in industrie
 - Zuinige apparaten
 - Spaarlampen

3

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Minder energie gebruiken

- Gedragsverandering
 - Het nieuwe rijden, openbaar vervoer, fiets
 - Thermostaat graadje lager
 - Lampen uit waar je niet bent
 - Was aan de lijn drogen
 - Andere producten kopen

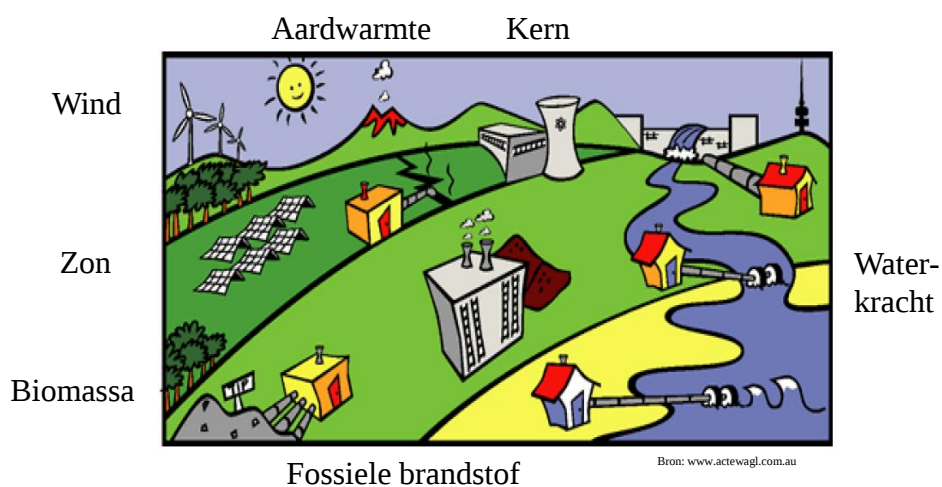
4

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Methoden voor elektriciteitsopwekking



5

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Gas

- Gas is belangrijk in NL
- Gas wordt gebruikt voor warmte en elektriciteit
- Gascentrales zijn efficiënt en flexibel
- Gas is schoner dan kolen



6

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Kolen

- Kolen worden voor 100% geïmporteerd
- Relatief goedkope opwekking van elektriciteit
- Minder flexibel dan een gascentrale



Bron: www.nuon.com

Bron: www.hier.nu

7

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Zon

- Nederland is niet echt een 'zonland'
- Zon levert elektriciteit en warmte
- De opbrengst is variabel
- Nu nog een erg klein deel van energieproductie
- De kosten dalen snel



8

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Wind

- Traditionele energiebron
- Snelle ontwikkeling wereldwijd
- In Nederland en op de Noordzee nog veel mogelijkheden
- De opbrengst is variabel
- Inpassing in het landschap kan een probleem zijn



9

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Waterkracht

- Niet veel toegepast in NL
- Stroming, Getijde



Bron: www.nuon.com

10

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Biomassa

- Import: NL produceert maar weinig biomassa
- Biomassa kan kolen en gas in centrales vervangen
- Ook toepassing in de chemie en brandstofproductie als vervanger van aardolie
- Biomassa voor energie concurreert met voedsel
- Productie van biomassa is niet altijd duurzaam



Bron: CSIRO

11

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Aardwarmte

- Veel mogelijkheden in gebieden met vulkanen, b.v. IJsland
- Warmte voor huizen, gebouwen, kassen
- In NL nog niet voor elektriciteit



Bron: www.installatiebedrijf vleeshouwers.nl

12

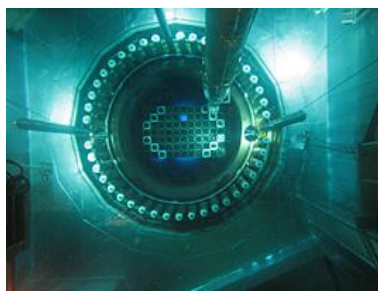
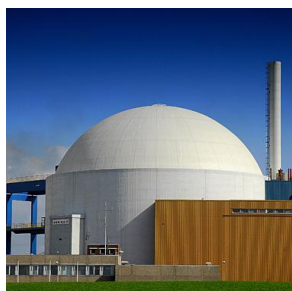
23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Kernenergie

- Geen directe uitstoot broeikasgassen
- Uranium wel uitputbaar, maar nog jaren voldoende
- Onderwerp van debat over risico's



Bron: www.epz.nl

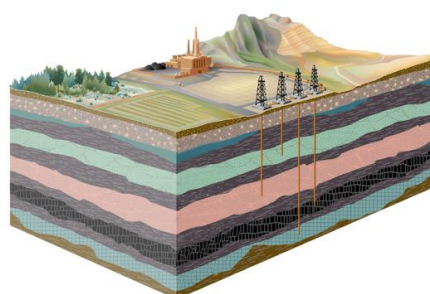
13 23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

CCS: Afvangen en opslaan van CO₂

- Geeft mogelijkheid om door te gaan met fossiele bronnen
- Opslag onder land of onder zee
- Extra kosten en energie



14 23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Wat kost dat?

- Energie is in de toekomst waarschijnlijk duurder
 - Brandstofprijzen omhoog
- Toekomstige kosten van nieuwe technologieën zijn onzeker
 - Nu vaak nog duurder dan fossiel
 - Ontwikkeling kan kosten omlaag brengen



15

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Wat doet de overheid?

- Doel NL in 2020: 14% duurzame energie
-20% CO₂
- Energiebelasting
- Stimuleringsregeling Duurzame Energie
- Emissiehandel
- Convenanten
- Normen voor voertuigen, nieuwbouw en apparaten

16

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Wat kun je zelf doen?

- LED / spaarlampen
- Zuinigere apparaten
- Verminderen warm water gebruik
- Isolatie
- Zuinige auto – of lopen/fietsen/OV
- Zonneboiler / zonnepanelen
- Koopgedrag

Wat kun je zelf doen?

- LED / spaarlampen
- Zuinigere apparaten
- Verminderen warm water gebruik
- Isolatie
- Zuinige auto – of lopen/fietsen/OV
- Zonneboiler / zonnepanelen
- Koopgedrag

Dank voor uw aandacht!



Bron: www.mijnsmart.nl

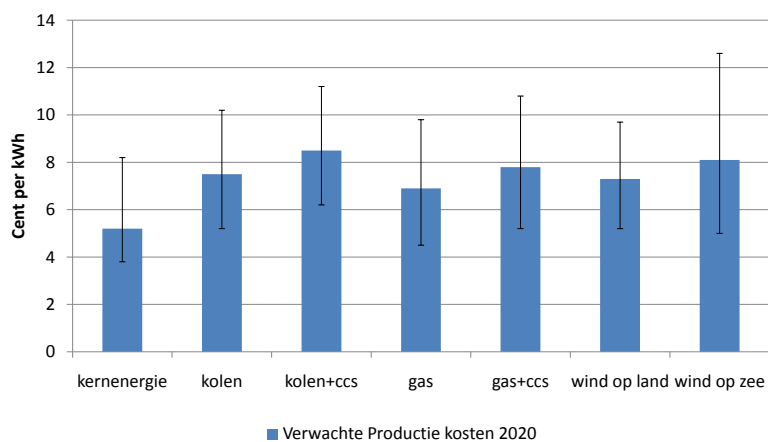
18

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Productiekosten elektriciteit in 2020



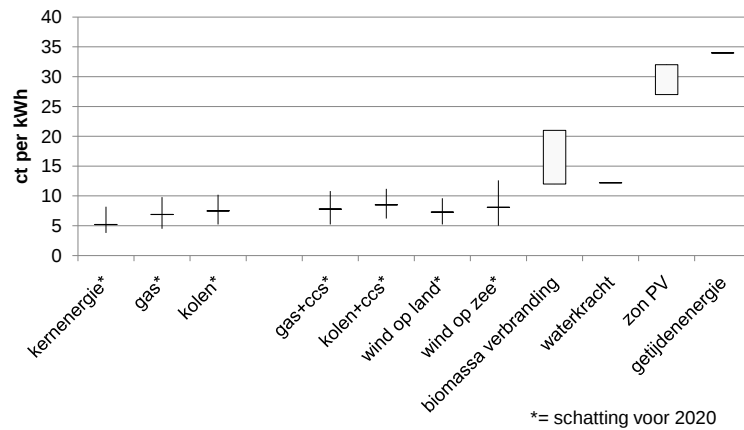
19

23-6-2011

Energy research Centre of the Netherlands

www.ecn.nl

Productiekosten elektriciteit





Agenda

- Wat is CO₂-afvang, -transport en -opslag (CCS)?
- Waar vinden CCS-projecten plaats?
- Voorbeeld van Nederlands CCS-project:
 - Rotterdam Opslag en Afvang Demonstratieproject (ROAD)



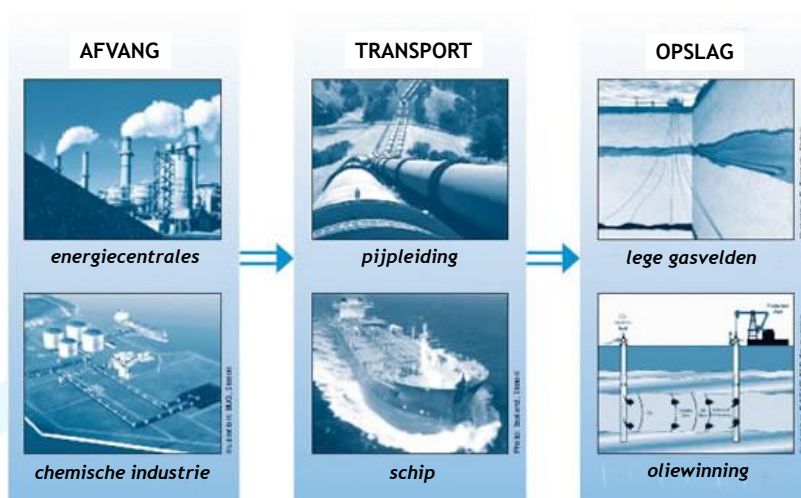
Page 2

Wat is CO₂?

- Wat is CO₂? koolstofdioxide of koolzuurgas $O=C=O$ 
- Wat doet CO₂? reuk-, geur- en smaakloos, niet brandbaar, niet explosief
- Hoe ontstaat CO₂? verbranding fossiele brandstoffen, uitademen mens
- Wat kan je met CO₂? frisdrank, kassen, brandblussers, grondstof industrie

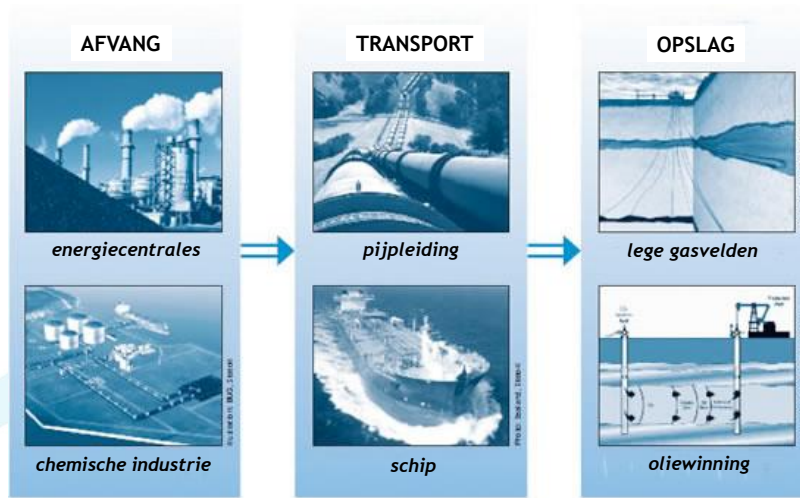
Page 3

Keten van CO₂-afvang, -transport en -opslag



Page 4

Keten van CO₂-afvang, -transport en -opslag

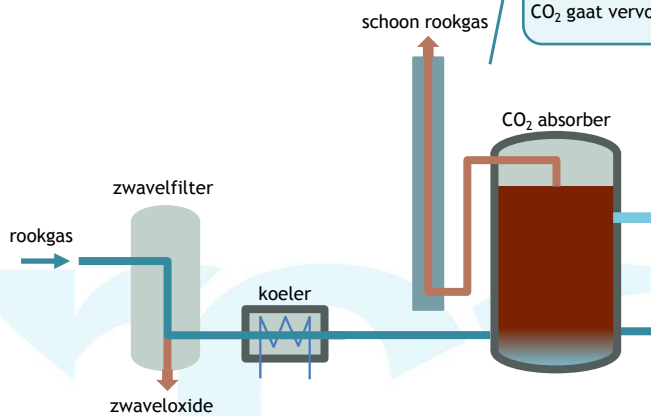


Page 4

CO₂-afvang

STAP 2

In de "absorber" wordt het rookgas gewassen. Hierbij komt de CO₂ in het rookgas in aanraking met een oplosmiddel waarin de CO₂ oplost. De nagenoeg CO₂ vrije rookgassen worden vervolgens via de schoorsteen uitgestoten. Het mengsel van het oplosmiddel en de CO₂ gaat vervolgens naar de zogenoemde "desorber".

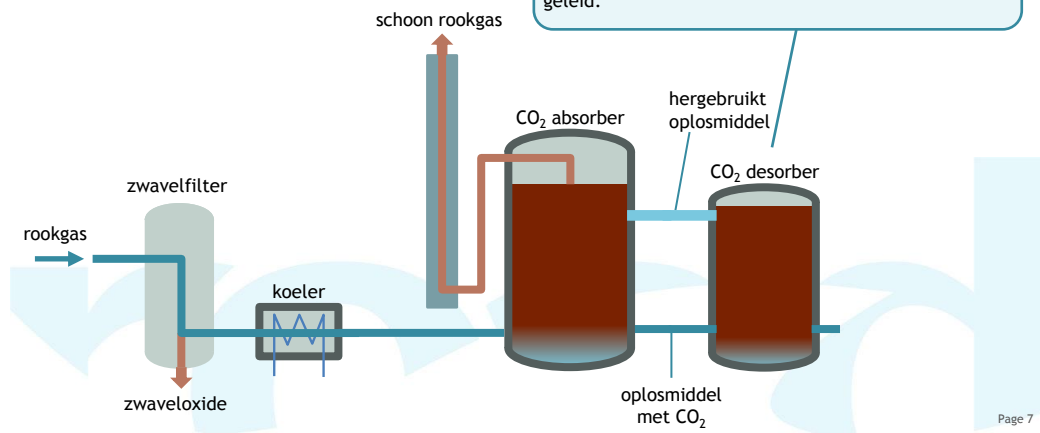


Page 6

CO₂-afvang

STAP 3

In de "desorber" wordt het mengsel van oplosmiddel en CO₂ met stoom verhit. Hierdoor wordt de CO₂ weer gescheiden van het oplosmiddel, dat vervolgens weer hergebruikt kan worden in de absorber. De hoog geconcentreerde CO₂ wordt naar een compressor geleid.

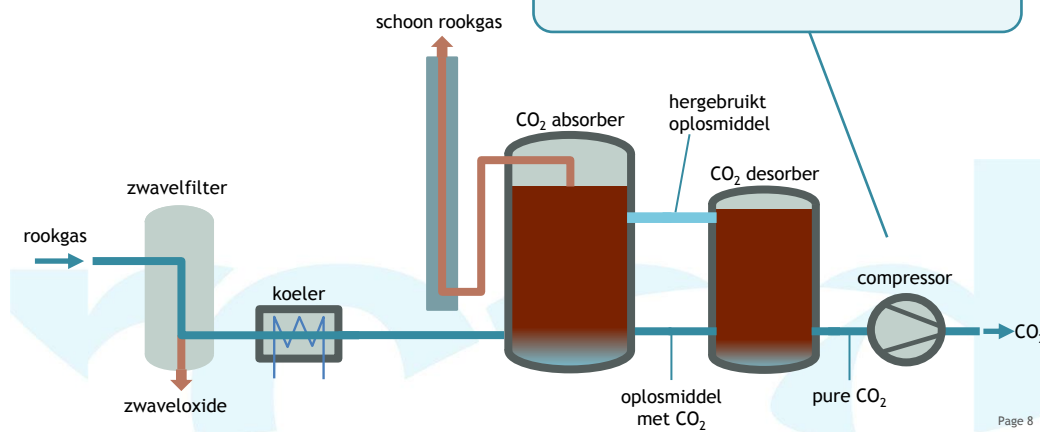


Page 7

CO₂-afvang

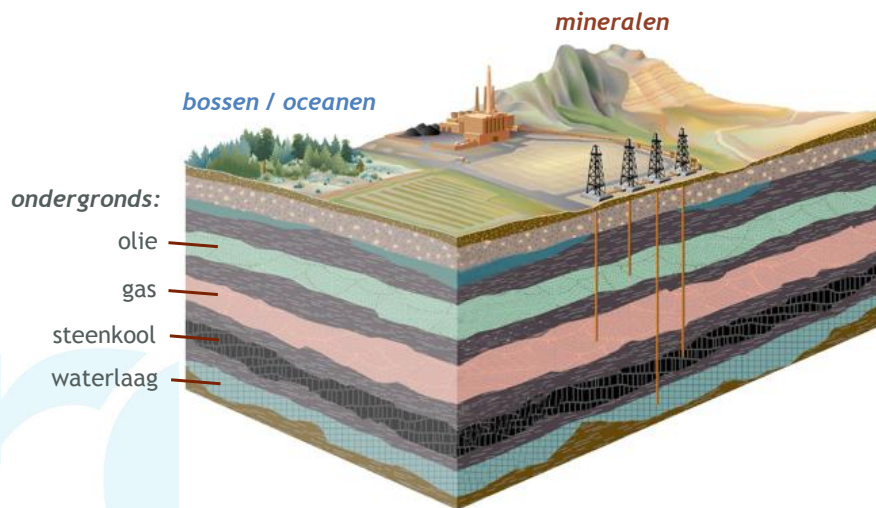
STAP 4

In de compressor wordt de CO₂ onder hoge druk gebracht en via een pijpleiding getransporteerd naar het platform op de Noordzee. Daar wordt de CO₂ geïnjecteerd in bijna lege gasvelden en permanent opgeslagen.



Page 8

Vormen van CO₂-opslag



Page 9

CCS-projecten wereldwijd



Page 10

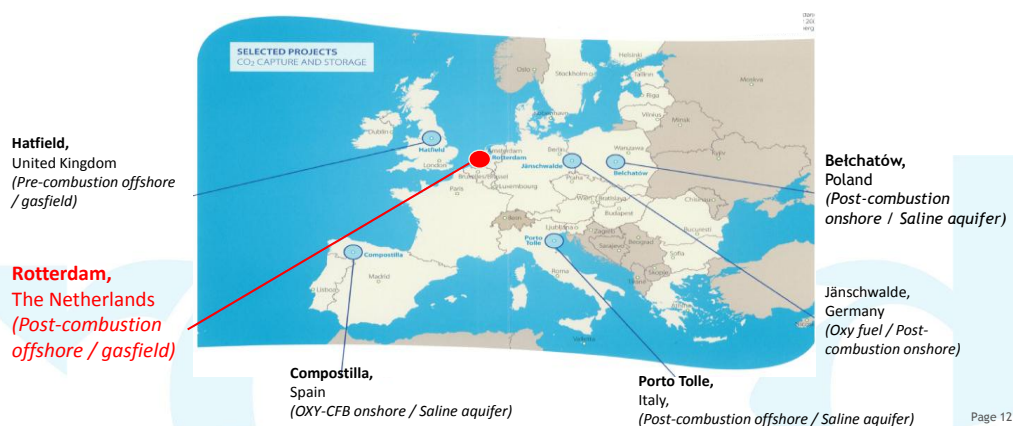
CCS-projecten Europa



Page 11

European Energy Programme For Recovery (EEPR)

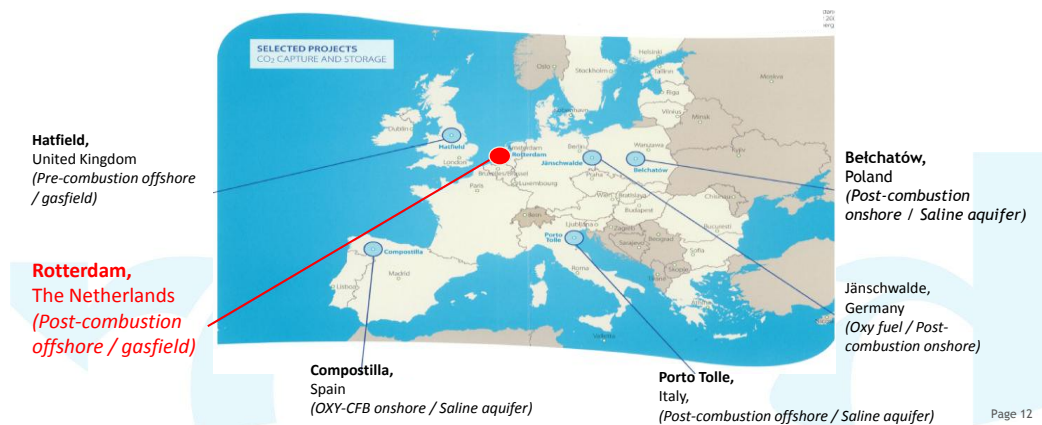
ROAD is door Europese Commissie geselecteerd als één van 6 EEPR projecten



Page 12

European Energy Programme For Recovery (EEPR)

ROAD is door Europese Commissie geselecteerd als één van 6 EEPR projecten



Waar staat naam 'ROAD' voor?

Rotterdam

Opslag

Afvang

Demonstratieproject

Wie is ROAD?

- Maasvlakte CCS Project C.V. is joint venture van:
 - E.ON Benelux
 - Electrabel Nederland (GdF-SUEZ Groep)
- In samenwerking met beoogde partners:
 - TAQA Energy
 - GDF SUEZ E&P
- Met financiële steun van:
 - Europese Commissie (EU)
 - Rijksoverheid
 - Global CCS Institute

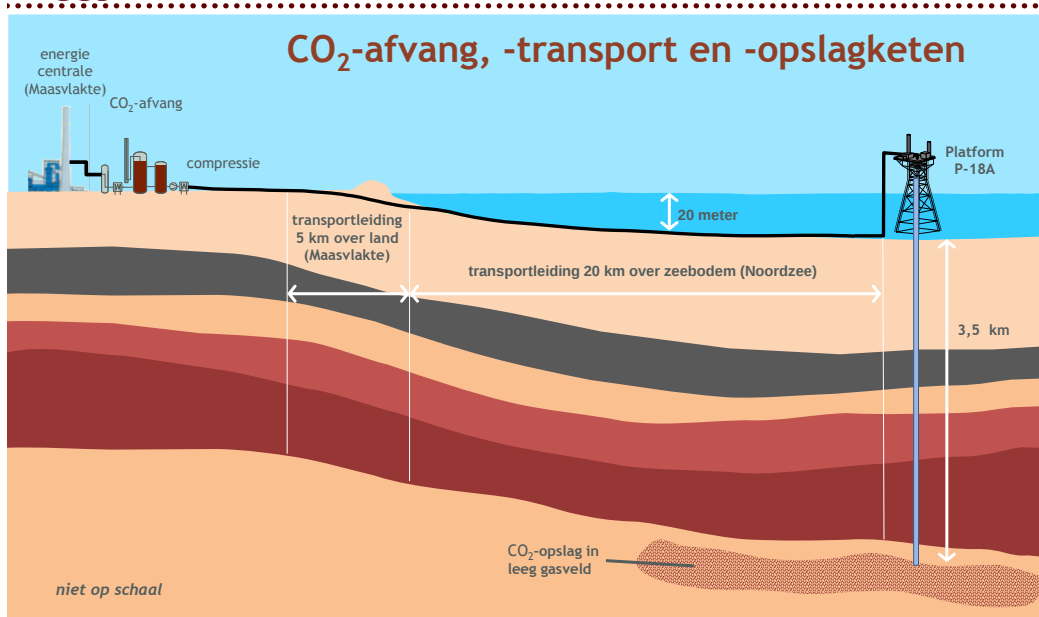


Page 14

Wat zijn doelstellingen ROAD?

- Demonstreren haalbaarheid (technisch, economisch) van gehele CCS-keten op grootschalig (industriële) niveau
- Vanaf 2015 circa 1,1 miljoen ton CO₂ per jaar afvangen en opslaan in (bijna) lege gasvelden
- Kennis en ervaring opdoen met gehele, grootschalige CCS-keten:
 - Technisch
 - Juridisch
 - Economisch
 - Organisatorisch
 - Maatschappelijk

Page 15



Nieuwe elektriciteitscentrale op Maasvlakte



Nieuwe elektriciteitscentrale op Maasvlakte



Page 17

CO₂-afvanginstallatie



Page 18

CO₂-transport over land



Page 19

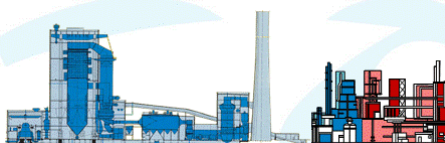
Opslaglocatie



Page 20

Tijdspad en mijlpalen

14 juli 2009	:	indienen projectvoorstel bij Europese Commissie
september 2009	:	selectie projectvoorstel door Europese Commissie
mei 2010	:	subsidiebeschikking Nederlandse overheid
september 2010	:	publicatie MER-startnotitie
Q2 2011	:	MER en vergunning aanvragen
2013	:	activering E.ON centrale MPP3
2015	:	volledige CCS keten operationeel
2015-2015	:	demonstratie CCS-keten



Page 21

Maasvlakte CCS project C.V.
Parallelweg 1
3112 NA Schiedam
www.road2020.nl



Government of the Netherlands



Co-financed by the European Union
European Energy Programme for Recovery

Page 22