Bioenergy

a Democs game

This Democs game has been created by

the New Economics Foundation and Edinethics Ltd.

as part of the BBSRC's Bioenergy Dialogue toolkit

edinethics

BBSRC
bioscience for the future

nef
economics as if people and the planet mattered

What's all this about?

Democs is a group discussion method based around cards which was devised by the New Economics Foundation (nef) in 2001.

This Democs game is a chance to explore bioenergy. You can learn about what it is, consider the issues, and give your opinions about it. No expert knowledge is required!

So what's bioenergy?

Bioenergy is a general term for any way of using biological materials (collectively called 'biomass') from plants, animals or humans to produce energy. This can be burning solids directly like wood or household rubbish, or converting crops, residues or wastes into liquid (biofuels) or gas (biogas). A waste is something which has no future use and is discarded, like carbon dioxide when fuel is burned in a car. Residues are things which aren't the main product but are not necessarily just wastes, like straw from a food crop. A residue might be used for something else, like ploughing straw back as a soil nutrient.

This game focuses mainly on biofuels, which are renewable liquid or gaseous transport fuels derived from various types of plant or animal material. The aim is to replace oil and gas from fossil fuels; to contribute to energy security, to help tackle climate change by reducing greenhouse gas emissions and to facilitate economic development.

Biofuels are renewable because fresh supplies of the plants and the by-products used to make them can be produced as needed. So in theory there could be an unlimited amount and a secure supply, whereas once you use up fossil fuels they are gone. In principle, biofuels should also be 'carbon neutral' - only returning the carbon dioxide to the atmosphere which the plants had absorbed in growing. In practice, other factors may offset some of the climate change improvement, as we shall see.

The main current biofuels:

1. Bioethanol is a replacement for petrol. It's the same alcohol as in fermenting grapes or barley for wine or beer, but currently it's typically produced from sugar cane or beet, or cereals like maize, wheat and rice, and distilled to be used as fuel.
2. Biodiesel is a replacement for diesel oil. It is mainly made from vegetable oils (this is how diesel oil was first produced, in fact).
3. Biogas is produced from decomposition of animal or plant material - a process called anaerobic digestion.

There are three stages in producing biofuels from crops:

1. Feedstock production: growing and harvesting crops
2. Conversion of feedstock into biofuel
3. Most biofuels need to be blended with fossil fuels and transported so they can be sold at biofuel pumps.

First generation biofuels used commercially today have mostly used existing food crops like maize and vegetable oils, and have been controversial. New biofuels technology aims to use abundant biomass feedstocks of non-food crops (like willow trees or grasses) or unused residues from food crops (e.g. woody parts like straw), or perhaps eventually water-borne algae. Unfortunately these are all more difficult to process into fuel, and need development to become economically viable. Other considerations include the need for minimal input of resources like fertiliser, land or water, and minimising harms to the environment or local populations and livelihoods.

New biofuels could also become very valuable as replacements for oil as the feedstocks to make chemicals, plastics other industrial materials.

Where do I come into this?

This Democs game is part of a wider programme of public engagement around bioenergy coordinated by the Biotechnology and Biological Sciences Research Council (BBSRC). It is recognised that there is potential for huge scientific and technological advancement in the area of bioenergy but to be effective as a significant contributor to the UK energy mix, bioenergy production must also be socially, economically and environmentally viable. BBSRC, want to be in a position to ensure that contemporary public views, concerns and aspirations are taken into account by research funders and researchers as more sustainable bioenergy solutions are developed. This Democs game is one of a number of tools that BBSRC will use to develop an ongoing, informed discussion between BBSRC, its research community and a range of stakeholders, including members of the public, around bioenergy research, its potential and the issues associated with it. The game has been written by nef and Edinethics Ltd, an Edinburgh-based consultancy company on ethics and technology.

What is a Democs game?

Democs is a conversation card game. Players get hands of cards and take turns to play them. But instead of playing to win, they are playing to learn about an important new issue - in this case it's bioenergy - and form their opinions about it. At the end of the game, the players will get to feedback their conclusions from the discussion. The kit is made up of several different types of cards. Most have information, ideas or stories about the topic.

One person acts as the dealer. It's the dealer's job to explain the rules, ask the questions and deal the cards, but he/she is not expected to be an expert on the subject! Usually, the dealer will be the person who has organised the game.

If you are thinking about organising a game, go for it! **Democs is designed to be played anywhere, by anyone.** All you need is a kit, about six to eight people (though you can play with more or less), a table and an hour and a half to two hours. You don't need to know anything about the topic to run a game and the rules are simple and easy to understand.

Kit contents

One set of instructions (which you're reading!)

Main cards

You can use these cards every time you play:

- 7 large pink story cards (Set S)
- 39 (green) information cards (Set A)
- 37 (blue) issue cards (Set B)

Single-use items

These items get written on during the game. We've given you enough for one or two games, but after that you'll need to go on www.bbsrc.ac.uk/bioenergydialogue and print some more.

- 10 white cluster cards
- 8 blank cards
- 8 'Making choices in the real world' forms
- 1 feedback form
- 1 stamped addressed envelope

How the game works

A Democs game has five rounds. In rounds 1, 2 and 3, players get dealt different hands of cards which are read out and discussed. The first round everyone is given a single story card to read out. In the rounds 2 and 3, players are given Information cards and Issue cards, respectively. Each player is asked to look at his/her hand of cards and select the ones that they think are most important or interesting. They read them out to the group, say why these ones interest them, and place them on the table. The group can comment and discuss them.

As the discussion develops, certain topics will come out. In round 4, players are asked to focus these into opinions, questions or statements which they would like to make about bioenergy, by grouping the cards into clusters. There can be several clusters on different topics, each of which gets written down on a cluster card.

In the final round (round 5), each player is given a copy of 'Making Choices in the Real World' and invited to fill it in.

After the game, there is a stamped addressed envelope for the dealer to send the cluster cards, the 'Making Choices' forms and the feedback form to:

Marta Entradas
Bioenergy Democs Feedback
External Relations Unit
BBSRC
Polaris House
North Star Avenue
Swindon
Wiltshire SN2 1UH

BBSRC will be analysing all the information that is sent in from lots of Democs games played by different groups around the country. This will help the organisation to learn more about what the important hopes, concerns and aspirations are for members of the public in relation to bioenergy. The results will be fed into BBSRC's policymaking through a number of key advisory panels and committees and the BBSRC Bioenergy Champion and inform how BBSRC supports bioenergy research in the future.

Dealer's instructions

Before the game – setting up

As the dealer, spend a little bit of time getting ready before the game starts. You need to:

- Carefully read the instructions and make sure you understand what happens in each round. There's a simple timetable on page 12 to refer to, but it helps to know where you're going beforehand.
- Check the kit to make sure you have everything
- Find a table, and a few pens
- Lay out the elements of the kit on the table in the order they will be used.

Basic Elements of the Game

Story Cards (Set S)

These are stories about some people and situations to do with bioenergy. All but one of the people are fictitious but the stories are based on real issues which have arisen, or ones which might arise in the future.

Information Cards (Set A)

These are facts about bioenergy. These come from experts and reliable sources of information.

Issue Cards (Set B)

These are different people's viewpoints and opinions on bioenergy. They are here to make you think, but they might be things that not everyone thinks are true.

Cluster Cards

These are used to label groups of cards which the players make and say what they mean. You can write directly on these, and re-use them if you use non-permanent ink.

Blank Cards

If anyone thinks of something important that's not included, they can write it down on a blank card.

Making Choices in the Real World

These are sheets which players use at the end to say how important the various goals for biofuels are. One copy is given to each player.

Feedback Form

So that we know who and where your results have come from, what you thought about the game, and what could be improved.

Introduction

Before you start, it's important that everyone knows the basic rules of the game. First of all, the dealer should explain the basics of the game. If you like, just read out the paragraph below on 'What is This Game About?' Explain that these discussions often work better if people agree on some guidelines beforehand. Then read out the conversation guidelines below and check that everyone is happy with them. Next, the dealer should explain what each of the sets of cards are and what they are for. You can use the list on page 10.

What is This Game About?

Bioenergy raises ethical and social issues which we need to discuss together as a society. This Democs game has been created so that members of the public like you can learn about bioenergy, using sets of cards. You can explore the wider questions that bioenergy raises, by working with the cards, and give your opinions at the end by voting on various applications. Some of the issues are quite complicated, so don't worry if you don't understand everything at once! This is an opportunity to learn and discuss.

Conversation Guidelines

- We are all equal – one person one voice/vote
- Your view matters – especially if you are the only one that holds it
- You have a right to be heard – but so does everyone else
- Listening is as important as speaking – so work at understanding as well as being understood
- Find common ground – look for where you agree
- Don't worry if you are surprised or confused – it might mean that you are learning something new.

Timetable – 90 minute version

The timings below add up to 90 minutes. If you have longer, please increase the timings appropriately.

Introduction	5 mins	The dealer explains what Democs is about, reads the conversation guidelines, and tells the group what each type of card is for. Then the dealer reads out the introductory information on pages 2-4.
Round 1: Stories	10 mins	Players use the story cards to introduce some of the issues about bioenergy through real or imaginary people.
Round 2: Information	15 mins	Players are dealt a hand of information cards about bioenergy. They choose two that interest them, to share with the group. This starts to assemble a shared knowledge 'bank'.
Round 3: Issues	15 mins	Players select from the issue cards in the same way, opening up ethical and social questions that they think are important.
Round 4: Creating clusters	30 mins	The group discusses the topics that are beginning to emerge, making links amongst the cards they have chosen in the previous two rounds. The linked cards from clusters. Each cluster has a theme which is written on the cluster cards.
Round 5: Voting and feedback	15 mins	Players give their views by individually filling in the Making Choices in the Real World forms. Dealer and Players also fill in the feedback form.

Introduce the Subject

Now you've explained how the game works, we turn to the subject itself, bioenergy. Because it will be unfamiliar to most people, read out to the group the whole of page 2 of this instruction booklet, entitled 'What's this all about?' This introduces the basic idea of bioenergy. Then explain that the players will find out more as the game proceeds, starting with a set of stories about people and situations to do with bioenergy.

Deal out the story cards to each player.

Story Cards

This is where each player is given a story to help them think about the important issues around synthetic biology. Tell them that Card 5 is about a real person and that while the rest are about fictitious people, the situations portrayed are real or at least plausible.

Shuffle the big pink story cards and give one to each player. (There are seven of these, so if there are more than seven players, some will have to share.) Each card ends in a dilemma.

In turn, ask each player to read out or summarise their card. When they have read it out, if they want they can say what they think about it and then other players can respond. But stick to time.

If anyone is very unhappy with their card, they can swap it for one of the spares (if there are any), or with one of the other players if both people agree.

Ask each player to put their story card in front of them, face up.

Information cards and Issue cards

These two rounds are the main information gathering stage. Players will look though the information and issue cards and choose the most important ones.

Shuffle the green information cards and deal them all out to the players. It doesn't matter if not all players have exactly the same number of cards.

Each player should pick the two most important cards from their hand. Players can choose what "important" means for themselves. It could be:

- Relevant to the dilemma on their story card
- Interesting
- Surprising
- Something they strongly agree with
- Something they strongly disagree with

Once they've chosen two they should put the rest of the cards in the middle of the table. Other players can look through these and if they wish use them to replace one or both of their initial choices. Once they've chosen their final two, the rest of the cards can be put to one side.

Ask players to take it in turn to play one card by reading it out to group and then explaining why they chose it. Once a player has finished reading the card out, other players can say something in response if they want to. Once the discussion has finished, the player puts the card down face up next to their story card. Each player should have two cards, so you need to go around twice.

After all the players have played their two green cards, deal them a hand of blue cards and do the same thing again.

Creating Clusters

In Rounds 1 – 3, players have put together in the middle of the table the green and blue cards they chose, together with each person's Story Card. These cards together form a 'knowledge bank'. The purpose of Round 4 is to try and identify main issues and common themes, and enter these on cluster cards.

There are two main ways to create the clusters. If your group has already identified some issues, look among the cards on the table and gather into a cluster the particular cards that relate to each issue. They can use blue cards, green cards, story cards, or a mixture of all three. The alternative way is to start with the cards on the table, to cluster the ones that seem to belong together, and create a theme from them. In practice you may do both. It's up to the players to decide what the clusters are about. The eventual aim is to create up to four or five clusters.

Some groups have found it helpful to start with one (or more) of the story cards and look for other cards that help tackle the dilemma on the card, and make these into a cluster.

Once the players are happy with a cluster, they need to fill in a cluster card. There are three things to decide and fill in. First decide a title for the cluster and write this in the first space. Then the group should come up with a one or two sentence summary, and write this in the second space on the card. Try and make the message as clear as possible so that we can understand exactly what you mean. Thirdly, **write the numbers** of all the cards in the cluster on the bottom of the card. This is so we have a record of which cards were used. This will form part of the analysis of the results.

Encourage the players to take their time so that everyone is happy with the clusters. Look for consensus as far as possible, but if opposing opinions come out, then these can both be given.

In the same way, complete a cluster card for each of the other clusters. Cluster cards are important because they allow you to tell us what you think, in your own words. These opinions and the list of cards you selected both become useful data when we come to analyse the results of all the games.

Round 5

Voting

In this last round, players are asked to fill in the Making Choices in the Real World forms. Unlike the clustering which is a group exercise, each person has their own sheet to fill in, and each votes as an individual. There are instructions on the forms.

At the end

Thank everyone for taking part and ask them to help you fill in the feedback form. This gives people chance to say what they thought about the game. When you have done this, write at the top, the date the place and the name of your group, so that we know which game this was when we come to analyse all the results. Then take the four or five cluster cards, and the Making Choices in the Real World forms and any blank cards people have written on and put these with the feedback form into the stamped addressed envelope provided and send this back to us. Gather up the cards and put them back in the box. Sometimes we also want the whole box back, to re-use it. If so, we will already have let you know. Otherwise please keep it, and maybe find some other friends to play it with!

Top tips for dealers

1. **The rules are not the point.** The aim of this game is let people discuss the issues. As long as people are discussing, don't worry too much about the details.
2. **It's good to talk...** Since the point is to talk about the issues, encourage people to say what they think and to respond to each other's views (politely!)
3. **...but silence is OK too.** At the beginning of the game, people will spend more time reading cards than talking. Don't worry, discussion will come later.
4. **No surprises.** Make sure all the players know how the process fits together so they can figure out what they need to do next.
5. **Stick to time.** If you think you'll struggle, set an alarm that rings when the each session should end.
6. **Don't get involved in the conversation.** Your role is to help other people to have their say. If you keep talking, you'll disrupt other peoples' ability to have their own conversation.
7. **Everyone deserves to be heard.** Make sure everyone gets the chance to speak. One way to do this is to ask people at the start to agree to let others finish before they start to speak. If you do this, remind people of their agreement when they forget it!

Bioenergy information cards A1 – A39

	Card	Ref/page no.
1.	What is biomass?	3/46
2.	Different criteria for evaluating biofuels	11/vi
3.	How much can biofuels contribute?	11/8
4.	Bioenergy old and new	11/9
5.	Plant residues: lignocellulose	8
6.	Alternative Fuels from Plant Residues	1/Box 3.1
7.	Future biofuels 1	1/Box 3.1
8.	Future biofuels 2	1/Box 3.1
9.	Using straw for biofuels	1/3.7
10.	Using unused land for future biofuels	1/3.10
11.	Biofuels from algae	4/115 + 8
12.	Fuels from plant residues using synthetic biology	7/Info card 28
13.	The cost of new biofuels	4/113
14.	What land is available for energy crops?	11/vi + vii
15.	How biogas is made	1/ Intro paras 8 + 9
16.	New infrastructure	1/Box 2.3 + 12/21
17.	Does bioethanol require dedicated vehicles?	12/21
18.	The resource context for biofuels	1/6.5
19.	Obstacles to the use of bioethanol in transport	12/69
20.	The Somerset Biofuel Project	13
21.	Biofuels in the past	1/1.1

22.	Biofuels and economic development	1/1.27
23.	Support for biofuels manufacturers in the UK	1/1.43
24.	Production of bioethanol in 2008	3/49
25.	Energy security	1/1.8
26.	Policies for biofuels	1/5.12
27.	Biofuels and biodiversity	6/Sort cards
28.	Biofuels and UK greenhouse gas (GHG) emissions	1/1.39
29.	Replacing fossil fuels	3/63 + 64
30.	No free lunch – biofuels still have a climate impact	4/113
31.	Usefulness of biofuels in specific situations	4/200
32.	When biofuels increase greenhouse gas emissions	9
33.	Biofuels and land use in Britain 1	4/247
34.	Biofuels and land use in Britain 2	5
35.	Benefits for biofuels in developing countries	1/1.28
36.	Replacing products based on fossil fuels	16
37.	What is bioethanol?	17
38.	How much biofuel are we using in the UK?	18
39.	The potential for biogas in the UK	4/248

1. Biofuels: Ethical Issues, Nuffield Council on Bioethics, April 2011
2. Vision, Strategy and Implementation for Bioenergy in the UK, RCUK Cross Council and TSB Bioenergy Strategic Co-ordination Group, undated

3. BBSRC Sustainable Bioenergy Scenario Tool, Robert Dingwall, Andy Balmer, Murray Goulden, undated
4. Zero Carbon Britain 2030, Centre for Alternative technology, 2010
5. Bioenergy Research, BBSRC
6. Teaching resources: biofuels, Nuffield Council on Bioethics, downloaded on 9th December 2011 from http://www.nuffieldbioethics.org/education/education-teaching-resource-biofuels
7. Democs kit on synthetic biology
8. Biofuel, Wikipedia, http://en.wikipedia.org/wiki/Biofuels, accessed 9th December 2011
9. Assessing Biofuels Factsheet, UNEP, 2009
10. Green charcoal for sustainable development, Pro Natura, http://www.biochar-international.org/Pronatura, accessed 9th December 2011
11. Raphael Slade, Robert Saunders, Robert Gross, Ausilio Bauen, Energy from biomass: the size of the global resource (2011). Imperial College Centre for Energy Policy and Technology and UK Energy Research Centre, London
12. BioEthanol for Sustainable Transport, Results and recommendations from the European BEST project
13. The Somerset Biofuel Project Information Leaflet, http://www.somerset.gov.uk/irj/go/km/docs/CouncilDocuments/SCC/Documents/Environment/Sustainable%20Development/200803FuelTheFuture.pdf, downloaded 15th December 2011

14. http://www.physorg.com/news201799021.html

15. http://www.monbiot.com/2007/03/27/a-lethal-solution/

16. http://www.bbsrc.ac.uk/web/FILES/Publications/bbsrc-business-autumn-2010.pdf

17. http://www.somerset.gov.uk/irj/go/km/docs/CouncilDocuments/SCC/Documents/Environment/Sustainable%20Development/200606BESTproject.pdf

18. http://www.nuffieldbioethics.org/sites/default/files/files/RED_implementation_NCOB_Parliamentary_briefing(1).pdf

19. http://www.biofuelwatch.org.uk/wp-content/uploads/Biofuels-Scientists-Letter2.pdf

20. http://www.actionaid.org.uk/doc_lib/meals_per_gallon_final.pdf

Bioenergy issue cards B1 – B37

	Card	Ref/page no.
1.	Does bioethanol production cause deforestation?	13
2.	What does a country need to make biofuels work?	11/56
3.	Biomass and the environment	11/57
4.	How tough should biofuel regulation be?	1/5.12
5.	Policies for current and future biofuels	1/6.17
6.	Biofuels and economic development	1/1.27
7.	George Bush on bioethanol	1/2.48
8.	Biofuels and hunger	4/114
9.	Biofuels can be produced anywhere	6/Sort cards
10.	Biofuels and aviation etc.	3/10

11.	We can't rely on oil for ever: what then?	6/Sort cards
12.	Comparing biofuels and fossil fuels	1/1.14 + 1.15
13.	Biofuels can suit more local production	1/1.14 + 1.15
14.	Habitat loss in Malaysia	1/2.38
15.	New biofuels and soil fertility	3/12
16.	Water use for biofuels	9
17.	Biofuels, carbon emissions and deforestation	3/65
18.	The climate impact of transport biofuels	3/65 + 4/113
19.	Developing appropriate biofuel crops	8
20.	Biofuels and human rights	1/5.10
21.	Growing biofuels on unused land	1/3.10
22.	Biofuels in developing countries	1/1.28
23.	Danger of land grab	4/114
24.	Biofuels and local communities	6/Sort cards
25.	Workers rights in Brazil	1/2.29
26.	The need for participation	1/4.50
27.	Who has a duty to develop biofuels?	1/4.52
28.	The principle of just reward 1	1/5.53
29.	The principle of just reward 2	1/5.53
30.	Biofuels and fair trade	1/Box 5.7 + 5.61
31.	Biofuels aren't enough: we have to drive and fly less too	
32.	We need biofuels!	20
33.	Should we have a moratorium on industrial biofuel production?	19

34.	Biofuels and land conversion	18
35.	Using Water vs Saving Carbon?	6
36.	Will the new biofuel technologies be viable?	19
37.	Diet and the land available for energy crops	11/34+44

1. Biofuels: Ethical Issues, Nuffield Council on Bioethics, April 2011
2. Vision, Strategy and Implementation for Bioenergy in the UK, RCUK Cross Council and TSB Bioenergy Strategic Co-ordination Group, undated
3. BBSRC Sustainable Bioenergy Scenario Tool, Robert Dingwall, Andy Balmer, Murray Goulden, 2012, www.bbsrc.ac.uk/bioenergydialogue
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17. http://www.nuffieldbioethics.org/sites/default/files/files/RED_implementation_NCOB_Parliamentary_briefing(1).pdf

18. http://www.biofuelwatch.org.uk/wp-content/uploads/Biofuels-Scientists-Letter2.pdf

19. http://www.actionaid.org.uk/doc_lib/meals_per_gallon_final.pdf

20. Department for Transport Factsheets 2011, UK transport greenhouse gas emissions http://assets.dft.gov.uk/statistics/series/energy-and-environment/climatechangefactsheets.pdf

Sources

Democs on bioenergy – story cards

1. Patricia Sinclair, scientist

Source: the shipping company who owns the cargo boats referred to is Maersk. A description of the trials can be found at many places on the web – for example http://www.bloomberg.com/news/2012-02-15/maersk-leads-shipping-industry-developing-fuels-to-cut-emissions.html. With respect to ships and pollution see: http://www.guardian.co.uk/environment/2009/apr/09/shipping-pollution

2. Steve Rollin, climate change campaigner

Sources: this is based on several sources. A good example of campaigning against the current generation of biofuels is provided by ActionAid: see their report 'Meals per Gallon: the impact of industrial biofuels on people and global hunger'. http://www.actionaid.org.uk/102322/new_biofuels_report_shows_how_europe_is_driving_hunger.html The reference to slavery in the last line is based on Biofuels: Ethical Issues, Nuffield Council on Bioethics, April 2011, chapter 2, paragraph 29.

3. Renata Luiz, environmental campaigner in Brazil

Source: Nuffield Report, biofuels, ethical issues, pp34 + 35

4. Kevin Watts, retired science teacher

Source: Nuffield report, chapter 2, para 48

5. Ian Bright, co-ordinator of an EU-funded biofuels project

Source: Ian Bright, unlike all the other characters, actually exists. What happened in Somerset under BEST is summarised at http://www.best-europe.org/Pages/ContentPage.aspx?id=138 The story was written after conversations with Ian, and checked by him.

6. Catherine Moore, MD of a small bioethanol company

Source: 'Big score for British biofuel technology, Insight, know-how and collaboration lead to multi-million deal', BBSRC website, 27 January 2012. http://www.bbsrc.ac.uk/news/industrial-biotechnology/2012/120127-f-british-biofuel-technology.aspx

7. John Graham, farmer

Source: Donald Bruce, personal experience

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If you would like to find out more information please see the BBSRC website www.bbsrc.ac.uk/bioenergydialogue or contact Marta Entradas, details as below.

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