Decision support with online collaborative models

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THL, Kuopio

Outline

- Assessments are to support decisions
- Knowledge crystals
- Collaboration in assessments
- Discussions within crystals
- Recommendations
- http://en.opasnet.org/w/Knowledge_crystal

Assessments are to support decisions

- It’s all about information flowing between people to right places

“Hobart, this is Merlin, my science adviser.”

WIKIPEDIA
The Free Encyclopedia

Main page
Contents
Featured content
Current events
Random article
Donate to Wikipedia
Wikipedia store

Interaction
Help
About Wikipedia
Community portal
Recent changes
Contact page

Tools
What links here

European Food Safety Authority

From Wikipedia, the free encyclopedia

"EFSA" redirects here. For other uses, see EFSA (disambiguation).

The **European Food Safety Authority** (**EFSA**) is the agency of the European Union (EU) that provides independent scientific advice and communicates on existing and emerging risks associated with the food chain.[1][2] EFSA was established in February 2002, is based in Parma, Italy and had a budget for 2008 of €65.9 million.

The work of EFSA covers all matters with a direct or indirect impact on food and feed safety, including animal health and welfare, plant protection and plant health and nutrition. EFSA supports the European Commission, the European Parliament and EU member states in taking effective and timely risk management decisions that ensure the protection of the health of European consumers and the safety of the food and feed chain. EFSA also communicates to the public in an open and transparent way on all matters within its remit.

European Food Safety Authority

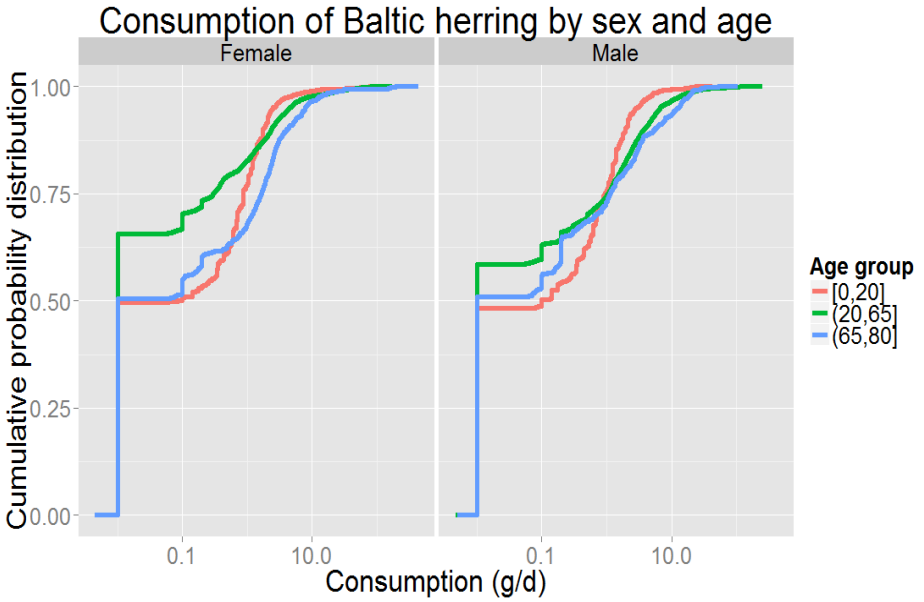
efsa
European Food Safety Authority

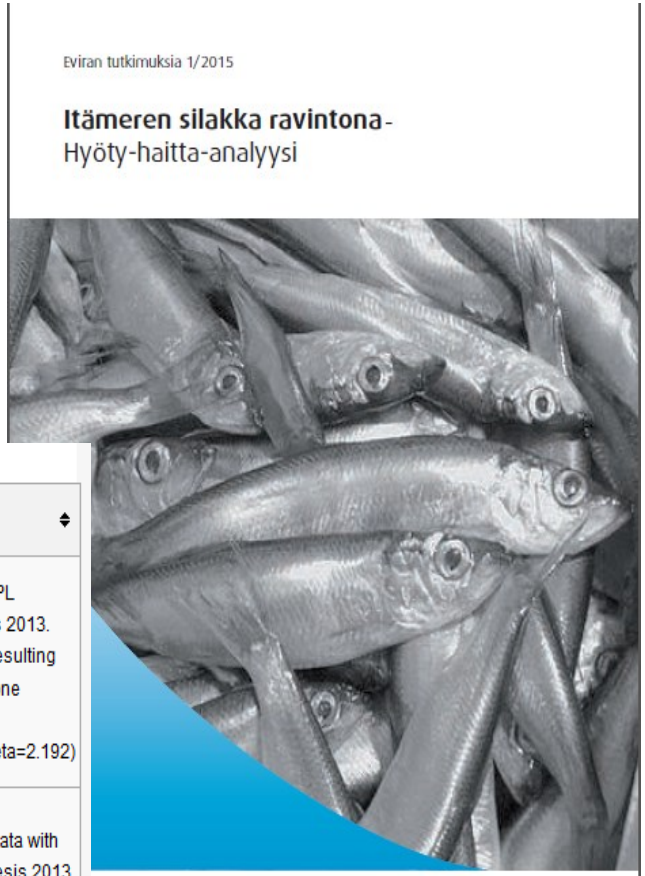
Authority overview	
Formed	21 February 2002
Jurisdiction	European Union
Headquarters	Parma, Italy
Motto	Committed to ensuring that Europe's food is safe

Questions Wikipedia does not answer

- What is the exposure-response function of dioxins (Ah receptor agonists) on developmental defects when the child is exposed during the pregnancy?
- What is the consumption distribution of Baltic herring in Finland in different age groups and areas?
- How to estimate health impacts of a particular exposure in a population with particular age and disasese characteristics?

Benefit-risk analysis of Baltic herring in Finland (2015)





Question [edit]

What are quantitative relationships between exposure to dioxin (a common name for polychlorinated dibenzo-p-dioxins, polychlorinated dibenzofurans (PCDD/Fs), and polychlorinated biphenyls (PCBs)) and several health impacts including

- remaining lifetime cancer risk and
- developmental defects in molar teeth

Answer [edit]

Run code

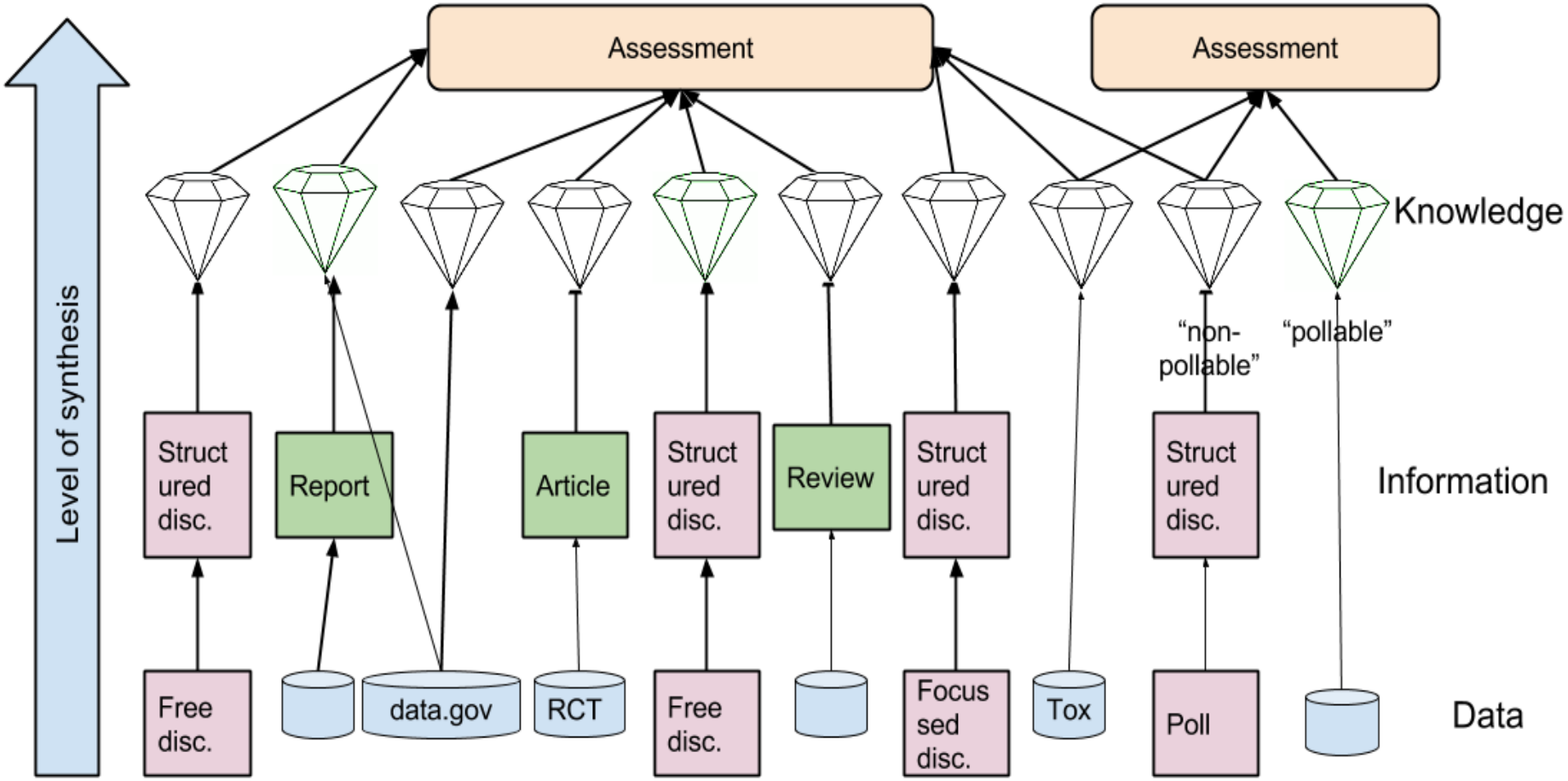
+ Show code

None	0	0.26 +- 0.12	Alaluusua et al. 2004; PL Gradowska PhD thesis 2013. From ERF of TCDD. Resulting distribution based on one simulation. Weibull(alfa=0.2925,beta=2.192)
None	0	0:0.06:0.12	Alaluusua et al. 2004 data with PL Gradowska PhD thesis 2013 approach but we used the response function y = k x + b (see below)

Knowledge crystal

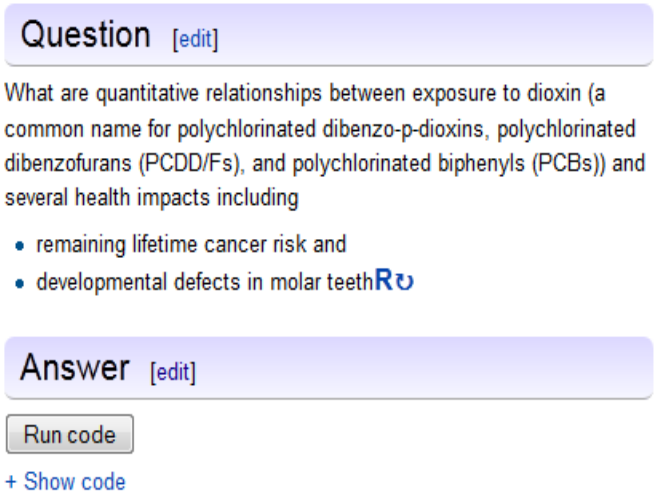
- Answers a specific research question.
- Is located in a permanent place on the Internet.
- Contains the best current answer to the question (in both machine-readable open data and text).
- Contains all available data, information, and discussions needed to convince a critical reader that the answer is a good one.
- Is continuously updated as new data appears.
- Participation is open but implies specific rules.

Knowledge crystals in an assessment



Collaborative models

- Online models using open data, knowledge crystals and open source code.
- Our choices on the Opasnet web-workspace:
  - R software, Mediawiki environment, Mongo DB
- Anyone can run, explore, and comment.
- No, this does not end up in chaos. Why?
  - Specific questions and topics.
  - Observations overrule opinions.
  - Contributions must hold against critique.
  - The truth is consistent with all facts…



Summary of discussions, interpretations, and conclusions based on data about chemical X and disease Y

Data	Hypotheses about chemical X causing disease Y		
	1) No effect	2) Oxidative stress	3) Receptor
Anecdote	-	+	+
Clinical experience	-	+	+
Structure-activity relationship	+	-	-
Observational study	++	-	-
Randomised clinical trial	-	+	+
Multi-center clinical study	-	++	++
Chronic toxicity study in rats	-	+	+
Review	+	+	+
Meta-analysis	+	+	+
Physiologically based pharmacokinetic and dynamic model	-	++	+
Proteomics	-	++	-
Etc			
Overall plausibility of hypothesis	-	++	+

Values and facts as building blocks

- An assessment consists of information on
  - Scientific statements (”facts” based on observations)
  - Value judgements (”values” based on observations about people’s opinions)
- Both are synthesised using the same rules.

Structured discussion

Statements: Climate change adaptation is more important than mitigation on city level.

Resolution: Not accepted. Climate change adaptation not seen to be more important than mitigation

(Resolved, i.e., the resolution has been updated to the main page.)

Argumentation:

⇤–# : To say that climate change adaptation is more important than mitigation is an overstatement because health benefits have been associated with climate change mitigation processes as a result of reductions in urban air pollution in the city level [7] --Michael Osei Assibey (talk)

--# : To just clarify, is to mean from your statement that a reduction in urban air pollution alone was enough to consider the health benefits in relation to these mitigation policies or could several factors be at play here? --Michael Osei Assibey (talk)

←–# It is true they are much better than adaptation strategies because mitigation policies have helped to see a decrease in city target emissions of green house gases in US states where there are mitigation policies as compared to those that do rely on adaptation strategies in their cities [8] --Michael Osei Assibey (talk)

⇤–# : Please although you have stated facts, as a citizen I must say that it cannot be convincing enough to depend on results of mitigation policies that have been successful without having concrete comparison with adaptation strategies elsewhere in order to clarify the above statement --Michael Osei Assibey (talk)

←–# : The concern shown above is true and speaking from a Municipal point of view from Ireland, it would be well noted that there are benefits as well with the application of adaptation policies as evident in the infrastructure adaptation to climate change and would be wrong to use an overriding statement of mitigation being more important than adaptation [9] --Michael Osei Assibey (talk)

--# : This is correct considering that adaptation strategies as in the case of the infrastructure changes in Ireland are indicative of the saving cost for Energy companies but also to help in reducing further damage to the climate --Michael Osei Assibey (talk)

→–#: These statements would indicate a change in policy making on the national scale and thus a more realistic approach would be to find a balance between the two (adaptation and mitigation) I think the statement should be that both mitigation and adaptation to climate changes are both equally needed on a city level. --Michael Osei Assibey (talk)

←–# : As an urban planner, the idea of trying to find a balance between mitigation and adaptation to climate change is what I agree to be the solution to city levels as evident in the study in the USA and Australia which found simultaneous achievement between adaptation and mitigation [10] --Michael Osei Assibey (talk)

--# : Considering that these are all good ideas backed by factual information it would also be good to see if these principles and methods used in the USA and Australia could be applied to developing countries that are struggling to cope with various climate change issues in terms of adaptation and mitigation --Michael Osei Assibey (talk)

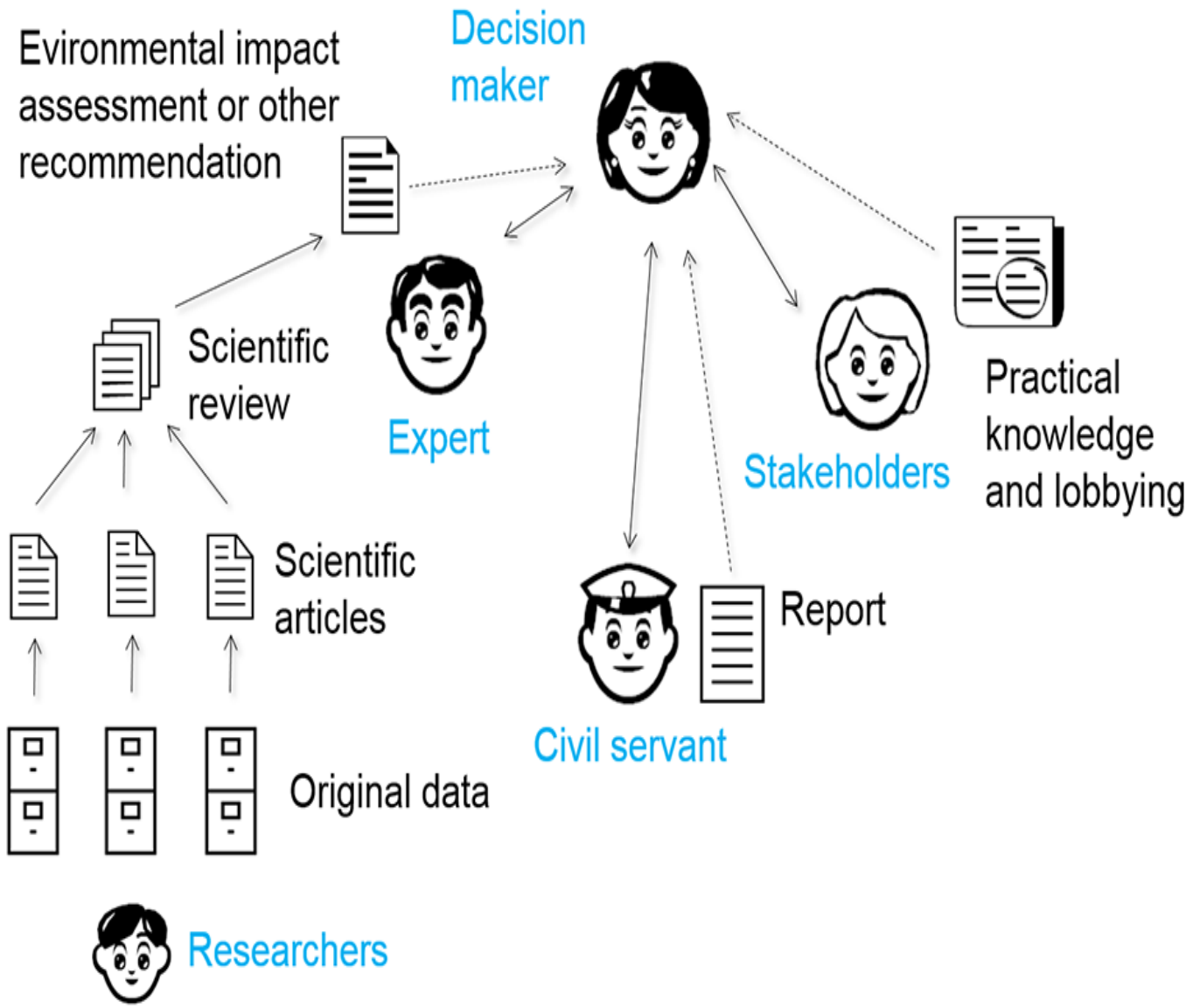
Recommendations

- Knowledge crystals should be promoted in assessments by EFSA and other organisations.
- Risk assessments should be done online with open source models and data.
- Knowledge crystals should bring you scientific merit (cf. articles, open data).

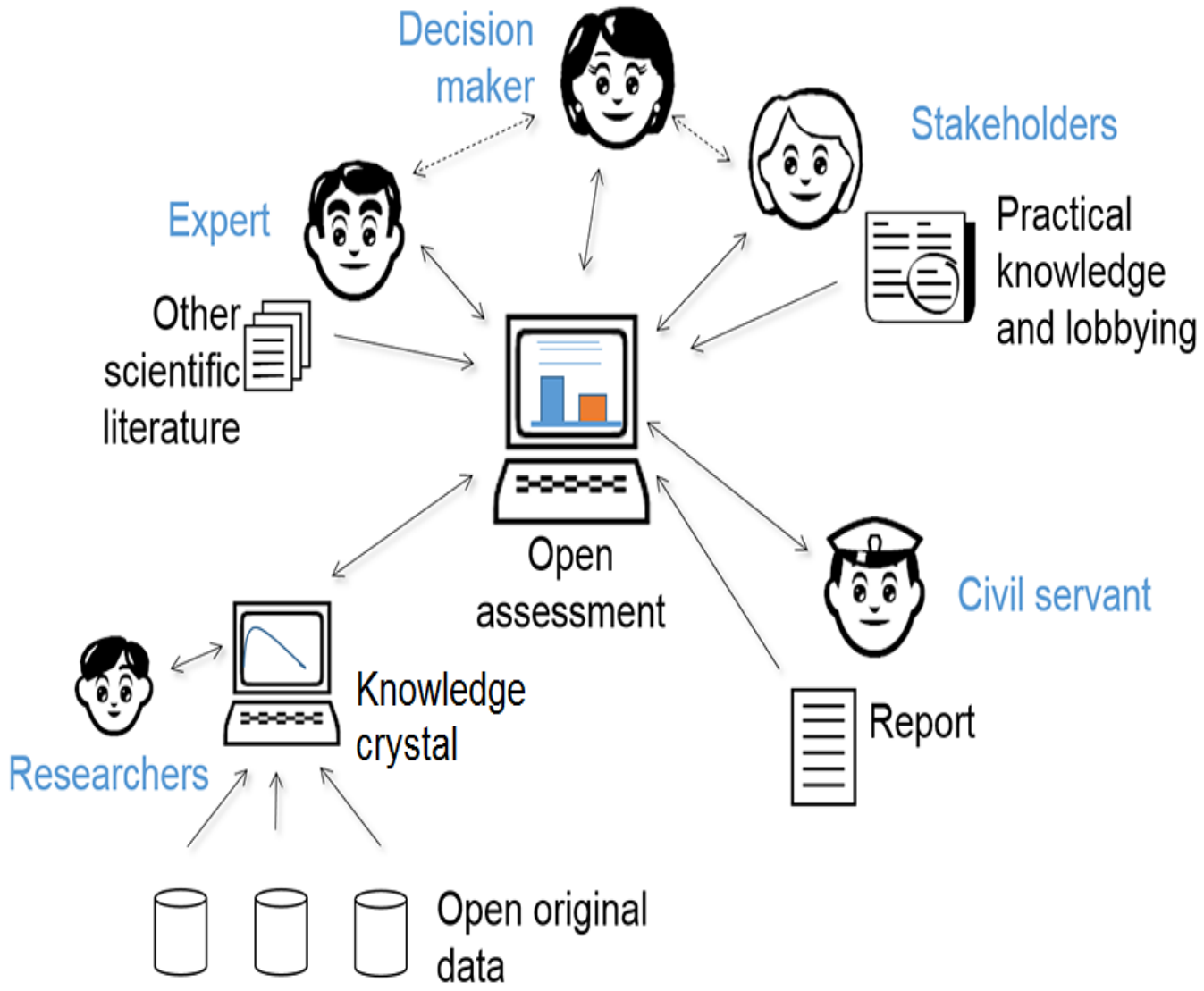
Assessment is discussion

- An open assessment is a quantitative discussion organised using open collaborative models.

Information flow in decision support now



Collaboration in open policy practice



Principles applied in open assessment

- Intentionality
- Shared information objects
- Causality
- Critique
- Reuse
- Openness

Vieraalija Lähetetty 25.1.2008 klo 14:21 Viesti 5/90

Liittynyt: 21.6.2007

Viestit: 0

Mitä helvettiä, 140 ?!!? ei ikinä. >_> siis, helsingin rannoista ei jää mitää jäljelle tommosen rakennusurakan jälkeen. Veikkaan että joudutaan peruuttamaan koko homma, tulee turhanpaljon vastustusta.. syystä

VASTAA LAINAA Ilmoita asiaton sisältö 0 0

Vieraalija Lähetetty 25.1.2008 klo 14:39 Viesti 6/90

Liittynyt: 10.3.2007

Viestit: 0

Rakentaisi vaikka enemmänkin, ei minua haittaa. Lisää tuulivoimaa!

VASTAA LAINAA Ilmoita asiaton sisältö 0 0

DerMack Lähetetty 25.1.2008 klo 14:43 Viesti 7/90

Liittynyt: 16.3.2005

Viestit: 1839

helsingin tuntien ne tuulimyllyt rakennetaan jonnekin hankoon ettei mene eiran näköalat pilalle

VASTAA LAINAA Ilmoita asiaton sisältö 0 0

Vieraalija Lähetetty 25.1.2008 klo 14:52 Viesti 8/90

Liittynyt: 30.4.2005

Viestit: 0

...eikös Sipoossa ole mukavaa koskematonta (suojeltua) rantakaistaa pilattavaksi

Musiikki ja museo pidentävät ikää

Universumissa kaikki aaltoilee

VIIKON GALLUP

Mitä lukemista antaisit oppilaalle valmistujaislahjaksi?

- Tietokirjan.
- Mietelausekokoelman.
- Klassikkoromaanin.
- Lehtitilauksen.

VASTAA Kommentoi Katso aiemmat

FACEBOOK

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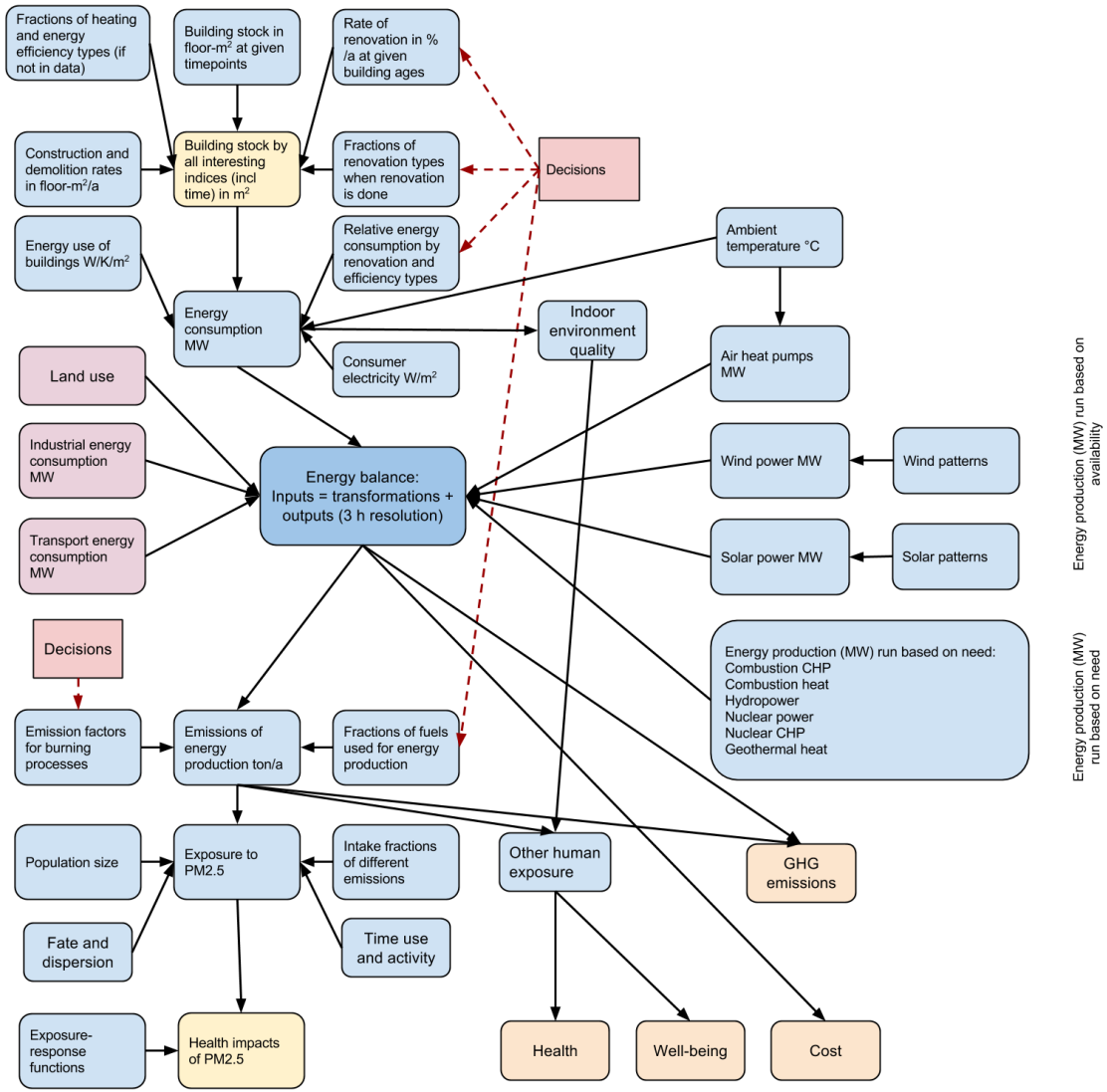
TIEDE Tiede Like

Causal diagram of Helsinki energy decision 2015



NATIONAL INST

Helsinki energy decision 2015

- A major decision will be made late 2015.
- Main options:
  - Business as usual (BAU)
  - Hanasaari and Salmisaari power plants are renovated
  - A new power plant is built in Vuosaari to burn 80 % wood-based fuel.
  - Hanasaari power plant is demolished and replaced with apartments.
  - Decentralised energy production is built as much as is feasible.
  - Massive energy saving campaign to reduce the need of energy.
  - District heating from Loviisa 3 power plant or Neste Oil refinery.

Helsinki energy decision assessment

- An online collaborative model has been launched to perform this assessment.
- Work coordinated by THL. Anyone can participate.
- Aim to stimulate large public discussion to
  - improve the quantitative assessment
  - Improve the richness and reliability of its input data.
- http://en.opasnet.org/w/Helsinki_energy_decision_2015

Resolutions of discussions

Discussions [edit]

These are some resolutions of discussions within the assessment.

- City level climate change mitigation is not useless although international treaties are important for success. D↷
- Climate change adaptation is not more important than mitigation on city level. R↻
- Citizens may have a key role in implementing city climate policies. D↷
- Food issues are underrepresented in climate discussions although food is a major emission source. R↻
- The role of district heating by nuclear energy in Helsinki is unclear. D↷
- There may be large uncertainty in CO_2 emission factors of biofuels. D↷

Variable

Answer [edit]

This code gets the ovariable of this page and calculates some basic results.

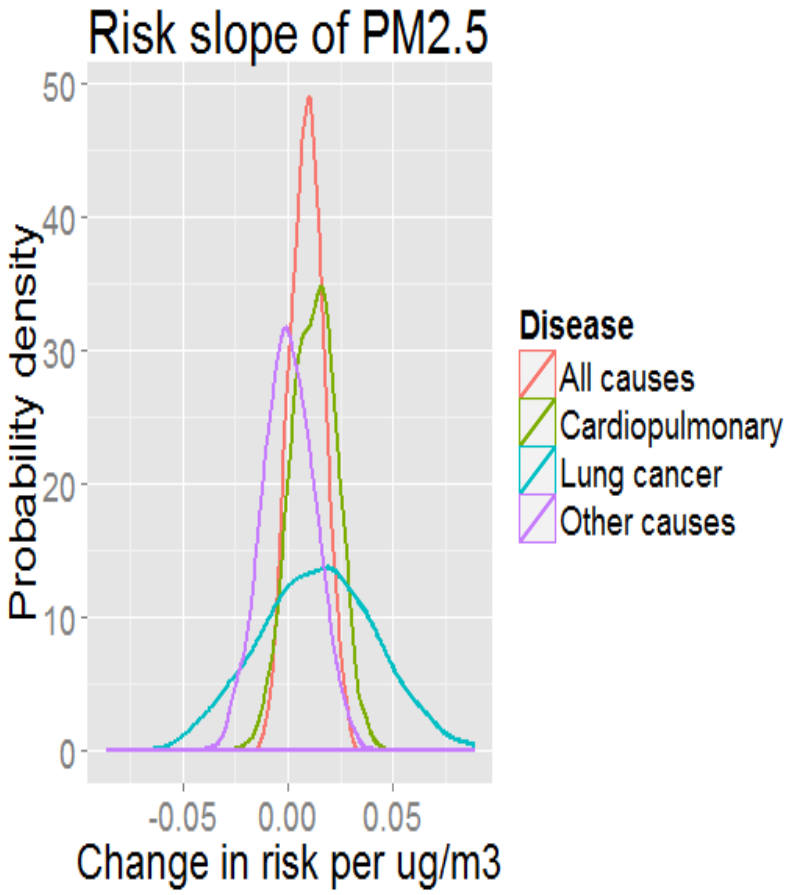
Run code

+ Show code

Rationale [edit]

⇤#: This paper should be included in the text.

- Burnett RT, Pope CA 3rd, Ezzati M, Olives C, Lim SS, Mehta S, Shin HH, Singh G, Hubbell B, Brauer M, Anderson HR, Smith Prüss-Ustün A, Turner MC, Gapstur SM, Diver WR, Cohen A. An integrated risk function for estimating the global burden of matter exposure. Environ Health Perspect. 2014 Apr;122(4):397-403. doi:10.1289/ehp.1307049 Epub 2014 Feb 7. Erratu Sep;122(9):A235. [1] [2] --Jouni (talk) 14:19, 26 January 2015 (UTC)



Data [edit]

Concentration-response function

Concentration-response to PM2.5(relative increase of mortality per µg/m3)

Obs	Disease	Response metric	Exposure route	Exposure metric	Exposure unit	Threshold	ERF parameter	ERF	Description
1	Cardiopulmonary	Mortality	Inhalation	Annual average outdoor concentration	µg/m3	0	Relative increase	0.0128 (-0.0036-0.0375)	Dockery et al. 1993 and Pope et al. 2002
2	Lung cancer	Mortality	Inhalation	Annual average outdoor concentration	µg/m3	0	Relative increase	0.0150 (-0.0350-0.0728)	Dockery et al. 1993 and Pope et al. 2002
3	Other causes	Mortality	Inhalation	Annual average outdoor concentration	µg/m3	0	Relative increase	0.0008 (-0.0232-0.0252)	Dockery et al. 1993 and Pope et al. 2002
4	All causes	Mortality	Inhalation	Annual average outdoor concentration	µg/m3	0	Relative increase	0.0091 (-0.0019-0.0289)	Dockery et al. 1993 and Pope et al. 2002

Structure of a variable

- Question
- Answer (a quantitative estimate, a posterior distribution)
- Rationale (anything that is needed to convince a critical reader that the answer is reliable)

Discussion types (based on level of synthesis)

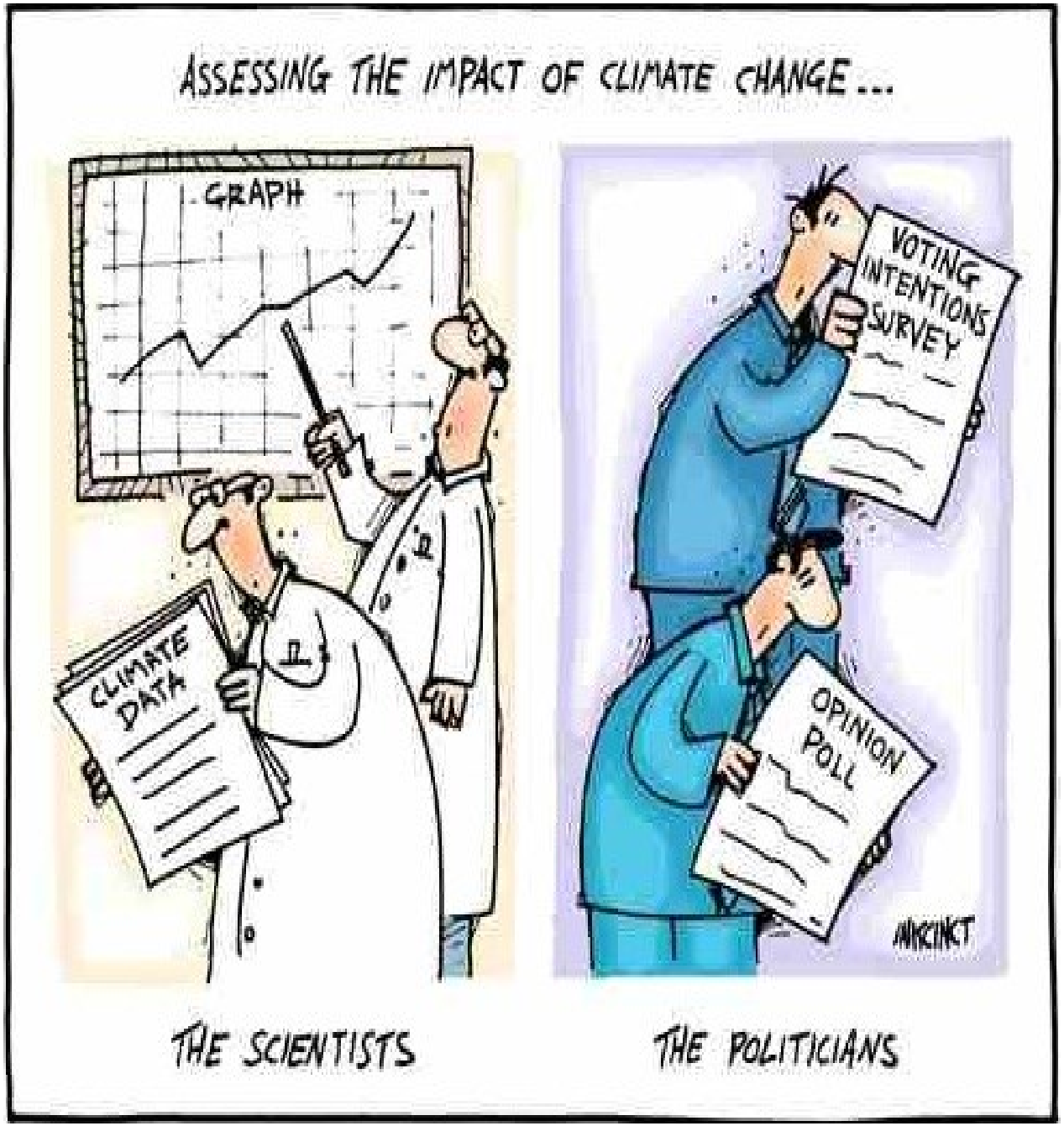
- Free discussions
- Focussed discussions (on a specific topic)
- Structured discussions (obeying discussion rules)
- Variables (quantified and modelled)

42

"I speak of none but the computer that is to come after me," intoned Deep Thought, his voice regaining its accustomed declamatory tones. "A computer whose merest operational parameters I am not worthy to calculate -- and yet I will design it for you. A computer that can calculate the Question to the Ultimate Answer, a computer of such infinite and subtle complexity that organic life itself shall form part of its operational matrix. And you yourselves shall take on new forms and go down into the computer to navigate its ten-million-year program! Yes! I shall design this computer for you. And I shall name it also unto you. And it shall be called ... the Earth."

-- Douglas Adams: The Hitchhiker's Guide to the Galaxy (1979)

Assess-ments are to support decisions



Example of collaborative models: Climate change policies in Kuopio

Example of collaborative models: Climate change policies in Kuopio

- http://en.opasnet.org/w/Climate_change_policies_and_health_in_Kuopio

Climate change policies and health in Kuopio

Main Page
Opasnet Base
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All pages
Main category
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Create ImageMap
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In other websites
Opasnet in Finnish

Main message:
Question:
What are the most beneficial ways from public health point of view to reduce GHG emissions in Kuopio?
Answer:
The target of 40 % GHG reduction seems realistic due to reforms in Haapaniemi power plant, assuming that GHG emissions for wood-based fuel is 0. Life-cycle impacts of the wood-based fuel have not yet been estimated.

This page is a assessment. [show]
The page identifier is Op_en5461

{{#display_map: 62.900223, 27.637482, Kuopio | zoom = 11 }}

Contents [hide]

1 Scope
1.1 Question
1.2 Boundaries
1.3 Scenarios
1.4 Intended users
1.5 Participants
2 Answer
2.1 Conclusions
2.2 Results
3 Rationale
3.1 Dependencies
3.2 Decisions
3.3 Direct inputs
3.4 Specific actions - real and potential

Answer [edit]

- Results from an assessment model run
- Climate change policies and health in Kuopio_model results

Conclusions [edit]

The target of 40 % GHG reduction seems realistic due to reforms in Haapaniemi power plant, assuming that GHG emissions for wood-based fuel is 0. Life-cycle impacts of the wood-based fuel have not yet been estimated.

Results [edit]

Calculate building stock into the future

- The dynamics is calculated by adding building floor area at time points greater than construction year, and by subtracting when time point is greater than demolition year. This is done by building category, not individually.
- Also the renovation dynamics is built using event years: at an event, a certain amount of floor area is moved from one energy efficiency category to another.
- Full data are stored in the ovariables. Before evaluating, extra columns and rows are removed. The first part of the code is about this.
- Full model run with corrected table 13th March 2015
- Full model run 23 Feb 2015
- Old example model run (running the model takes more than 6 min, so use this ready-made result)

Run code

+ Show code

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en.opasnet.org/en-opwiki/index.php?title=Special:RTools&id=s3zYXviOuNZtzMZz
Google

Biofuel policy in district heating

Remove this run

Run completed in 0h 03m 17s