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Session 19: Energy Supply and Security

Similarities and Differences in Views on Energy Security

A Comparison of Public and Stakeholder Perceptions in Germany

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Outline of the talk

- Point of departure
- Aim and conceptual basis of the study
- Methods
- Results
- Conclusions

Point of departure

- Energy security is one of the main targets of energy policy
- However, definitions of energy security range from

"uninterrupted availability of energy sources at an affordable price" [IEA, 2017]

to

"equitably providing available, affordable, reliable, efficient, environmentally benign, proactively governed and socially acceptable energy services to end-users" [Sovacool, 2016]

⇨ "Shared understandings of energy security cannot be taken for granted" [Blumer et al., 2015, 935]

Aim and conceptual basis of the study

Aim:

Investigation of similarities and differences in perceptions of energy security among the general public and stakeholders in Germany

Conceptual basis:

16 dimensions of energy security developed by Benjamin K. Sovacool et al. (2012)

Methods

- Translation and adaption of the 16 dimensions of energy security to the German context
- Evaluation of the dimensions by 1006 respondents in a representative survey of the German public, carried out in 2014 (IEK-STE Panel Survey 2014)
- Comparison of the public survey results to the results of a survey among 114 German stakeholders, carried out in 2010 [Sovacool et al., 2012]
- Additionally: ranking of five dimensions according to their importance for energy security in Germany, performed by the respondents of the IEK-STE Panel Survey 2014

Dimensions of energy security

No.	[Sovacool et al., 2012]	IEK-STE Panel Survey 2014
1	To have a secure supply of oil, gas, coal, and/or uranium	A secure supply of oil, gas and other energy sources
2	To promote trade in energy products, technologies, and exports	Promotion of international trade in energy products and technologies
3	To minimize depletion of domestically available energy fuels	Preserving of existing resources for future generations
4	To have stable, predictable, and clear price signals	Predictable and comprehensible development of energy prices
5	To have affordably priced energy services	Affordability of electricity and heat
6	To have small-scale, decentralized energy systems	Small-scale, decentralized energy systems
7	To have low energy intensity (unit of energy required per unit of economic output)	High energy efficiency
8	To conduct research and development on new and innovative energy technologies	Research and development on new and innovative energy technologies
9	To assure equitable access to energy services to all of its citizens	Ensure that no citizen is excluded from the purchase of electricity and heat
10	To ensure transparency and participation in energy permitting, siting, and decision-making	Transparency in the approval and settlement of energy infrastructure projects and participation in decision-making processes
11	To inform consumers and promote social and community education about energy issues	Energy security as the subject of education in schools and information about it for all citizens
12	To minimize the destruction of forests and the degradation of land and soil	Minimization of negative impacts of energy production and use on forests, land and soil
13	To provide available and clean water	Protection of drinking water against negative impacts of energy production and use
14	To minimize air pollution	Minimization of air pollution
15	To minimize the impact of climate change (i.e. adaptation)	Minimization of the impact of climate change by mitigation measures
16	To reduce greenhouse gas emissions (i.e. mitigation)	Reduction of greenhouse gas emissions

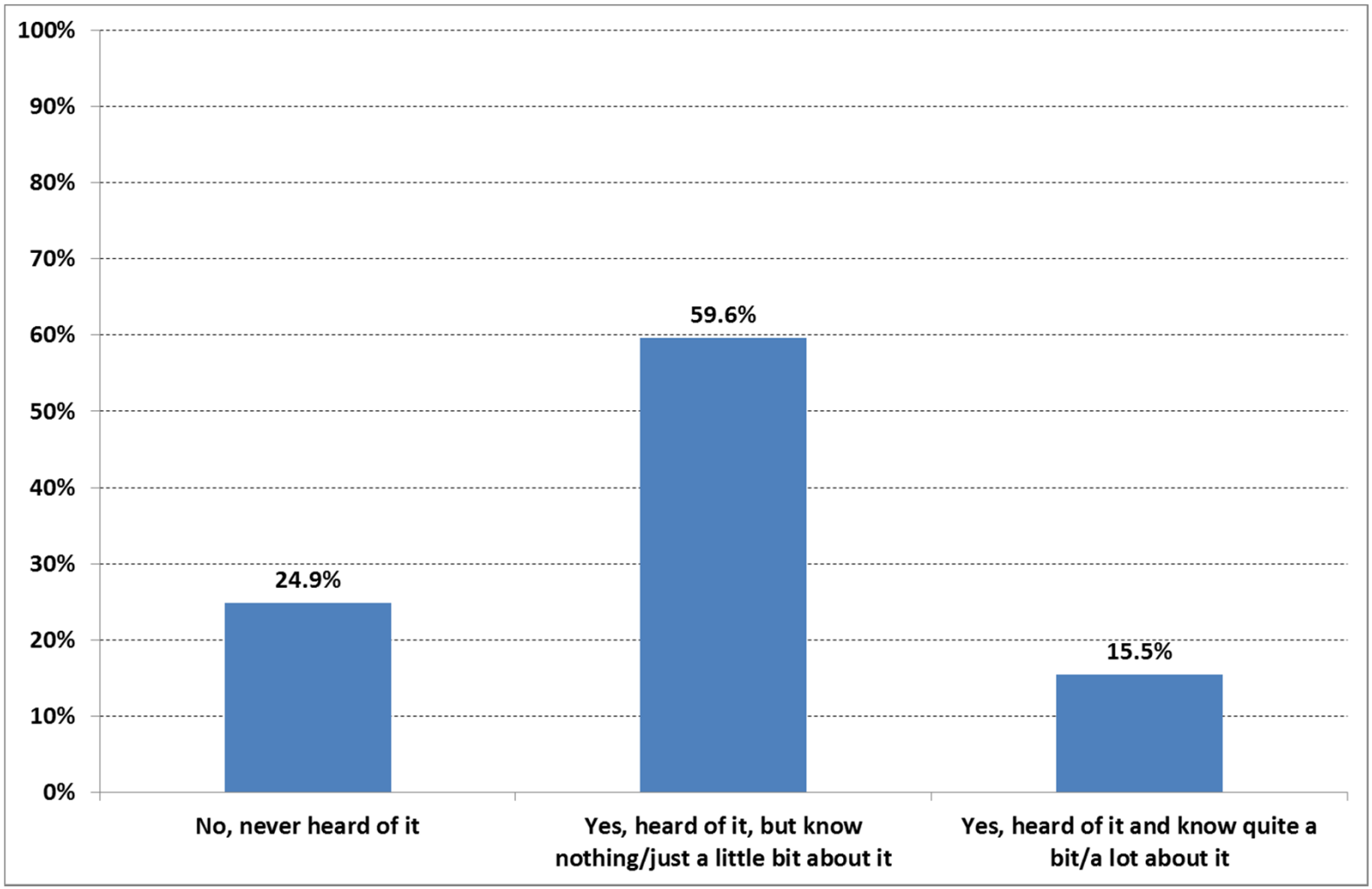
Selected dimensions of energy security

IEK-STE Panel Survey 2014
A secure supply of oil, gas and other energy sources
Promotion of international trade in energy products and technologies
Affordability of electricity and heat
Reduction of greenhouse gas emissions
Security policy cooperation with other countries to ensure safe ways of supplying energy

Results

Self-reported awareness of energy security

Have you heard about energy security?



Source: IEK-STE Panel Survey 2014 (n=1006)

Similarities in views on energy security

German public 2014 (n=1006)		German stakeholders 2010 (n=114)		
Statements	**Mean**	**Statements**	**Mean**	**Δ**
Protection of drinking water against negative impacts of energy production and use	4.54	To provide available and clean water	4.47	0.07
Ensure that no citizen is excluded from the acquisition of electricity and heat	4.53	To assure equitable access to energy services to all of its citizens	4.24	0.29
Minimization of air pollution	4.38	To minimize air pollution	4.46	-0.08
High energy efficiency	4.34	To have low energy intensity (unit of energy required per unit of economic output)	4.57	-0.23
Minimization of negative impacts of energy production and use on forests, land and soil	4.34	To minimize the destruction of forests and the degradation of land and soil	4.52	-0.18
Preservation of existing resources for future generations	4.33	To minimize depletion of domestically available energy fuels	4.07	0.26
Predictable and comprehensible development of energy prices	4.26	To have stable, predictable, and clear price signals	4.15	0.11
Minimization of the impact of climate change by mitigation measures	4.20	To minimize the impact of climate change (i.e. adaptation)	4.22	-0.02
Transparency in the approval and settlement of energy infrastructure projects and participation in decision-making processes	3.94	To ensure transparency and participation in energy permitting, siting, and decision-making	4.15	-0.21

Scale from 1 (=extremely unimportant) to 5 (=extremely important); Sources: [Sovacool, 2016, Sovacool et al., 2012]; IEK-STE Panel Survey 2014 (n=1006)

Differences in views on energy security

German public 2014 (n=1006)		German stakeholders 2010 (n=114)		
Statements	**Mean**	**Statements**	**Mean**	**Δ**
Affordability of electricity and heat	**4.64**	To have affordably priced energy services	4.15	0.49
Research and development on new and innovative energy technologies	4.42	To conduct research and development on new and innovative energy technologies	**4.89**	-0.47
Reduction of greenhouse gas emissions	4.28	To reduce greenhouse gas emissions (i.e. mitigation)	4.74	-0.46
A secure supply of oil, gas and other energy sources	4.26	To have a secure supply of oil, gas, coal, and/or uranium	**3.75**	0.51
Energy security as the subject of education in schools and information about it for all citizens	3.94	To inform consumers and promote social and community education about energy issues	4.41	-0.47
Small-scale, decentralized energy systems	3.66	To have small-scale, decentralized energy systems	4.34	-0.68
Promotion of international trade in energy products and technologies	**3.64**	To promote trade in energy products, technologies, and exports	4.23	-0.59

Scale from 1 (=extremely unimportant) to 5 (=extremely important); Sources: [Sovacool, 2016, Sovacool et al., 2012]; IEK-STE Panel Survey 2014 (n=1006)

Ranking of selected dimensions of energy security

Dimension	Rank	Mean	SD
Affordability of electricity and heat	1	1.8	1.1
A secure supply of oil, gas and other energy sources	2	2.4	1.2
Reduction of greenhouse gas emissions	3	2.9	1.3
Security policy cooperation with other countries to ensure safe ways of supplying energy	4	3.6	1.1
Promotion of international trade in energy products and technologies	5	4.2	0.9

Ranking from 1 (=most important factor for energy security in Germany) to 5 (=least important factor for energy security in Germany); SD= standard deviation; Source: IEK-STE Panel Survey 2014 (n=1006)

Conclusions

- Perceptions of energy security among the general public and stakeholders are similar to a large extent
- However, with regard to seven dimensions of energy security visible differences in the perceptions exist
- The differences are especially relevant for the management of energy transition in Germany
- Possible consequences of the energy transition for the affordability of electricity and heat and security of supply should be comprehensible and transparently communicated to the general public

Limits of the study

- The extent to which the differences in the evaluations of the energy security dimensions have been influenced by the differences in phrasing, survey formats or survey periods cannot be assessed
- Additional comparisons of public and stakeholder perceptions gathered with identical survey instruments are necessary, also in other countries, in order to find out whether our results can be confirmed

References

IEA (2017) Energy security, https://www.iea.org/topics/energysecurity/

SOVACOOL, B. K., et al. (2012) Exploring propositions about perceptions of energy security: An international survey. *Environmental Science & Policy,* 16:0**,** 44-64.

SOVACOOL, B. K. (2016) Differing cultures of energy security: An international comparison of public perceptions. *Renewable and Sustainable Energy Reviews,* 55**,** 811-822.

BLUMER, Y. B., MOSER, C., PATT, A. & SEIDL, R. (2015) The precarious consensus on the importance of energy security: Contrasting views between Swiss energy users and experts. *Renewable and Sustainable Energy Reviews,* 52**,** 927-936.

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Thank you very much for your attention!

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