Bio-Ökopoli

Political processes of bioeconomy between economy and ecology

Regulating the use of woody biomass for power and heat/cold generation in Germany

Biomass to Power and Heat,

Zittau, 06 June 2018

Katrin Beer, Michael Böcher, University of Magdeburg

joint research project of

FernUniversität in Hagen

Otto von Guericke Universität Magdeburg

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Projektträger Jülich
Forschungszentrum Jülich

Content Overview

The Bioeconomy

The Bio-Ecopoly Research Project

Bioenergy and the Lusatia Region

The Bioeconomy

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Bio-Ökopoli

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Bioeconomy

The Bioeconomy

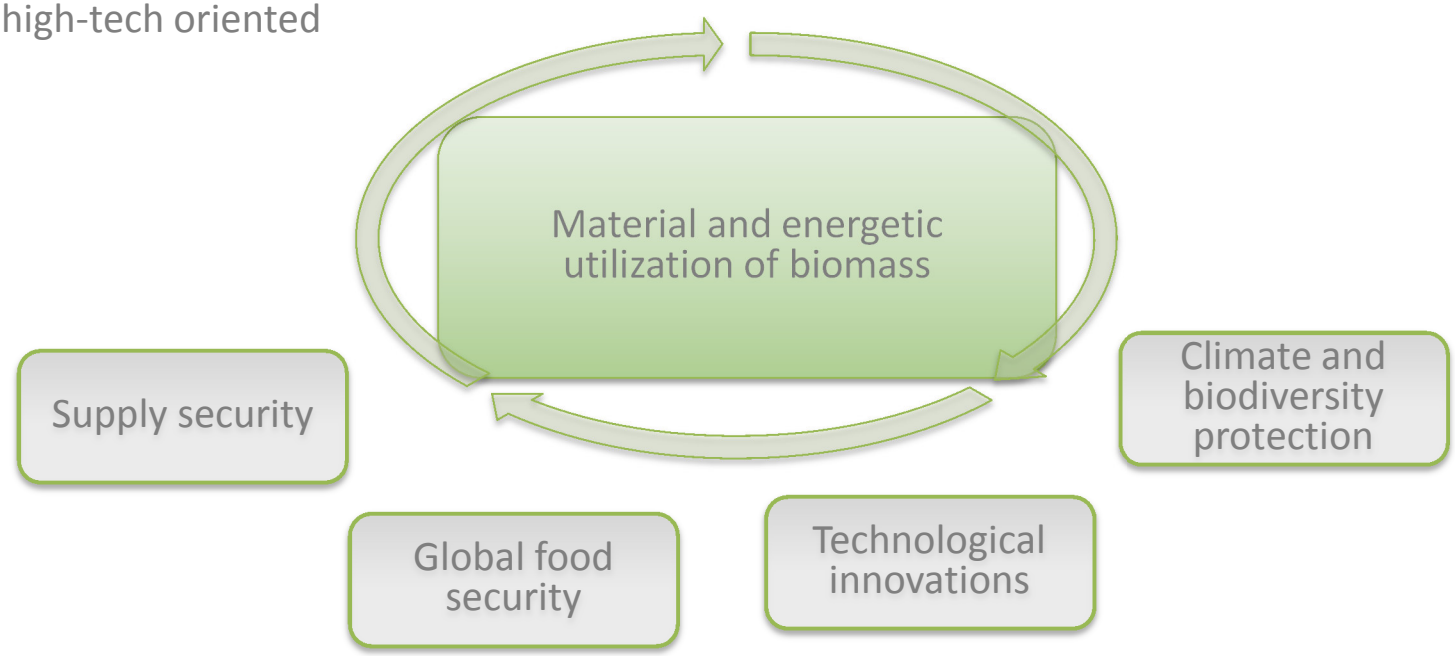
The Bio-Ecopoly Research Project

Bioenergy and the Lusatia Region

Sustainable use of biomass, knowledge-based, high-tech oriented

Replacing fossil resources with bio-based materials

Coupled and cascaded use, efficient use of biomass, circular economy



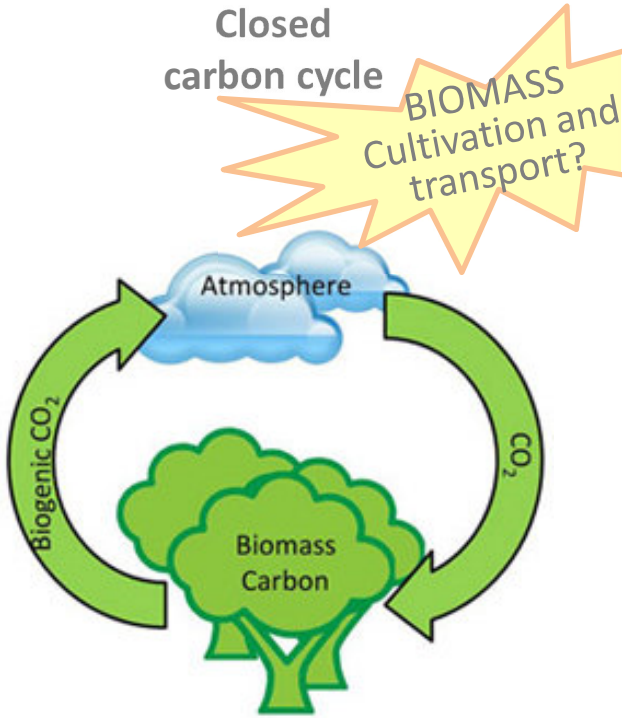
Fossil energy vs. bioenergy

Ca. 60 % of global GHG emissions from energy sector

Dominant contributor to anthropogenic climate change

Fossil fuel combustion transfers geologic carbon into the atmosphere. It is a one-way process.

Closed carbon cycle



Biogenic carbon is part of a relatively rapid natural cycle that impacts atmospheric CO_2 only if the cycle is out of balance.

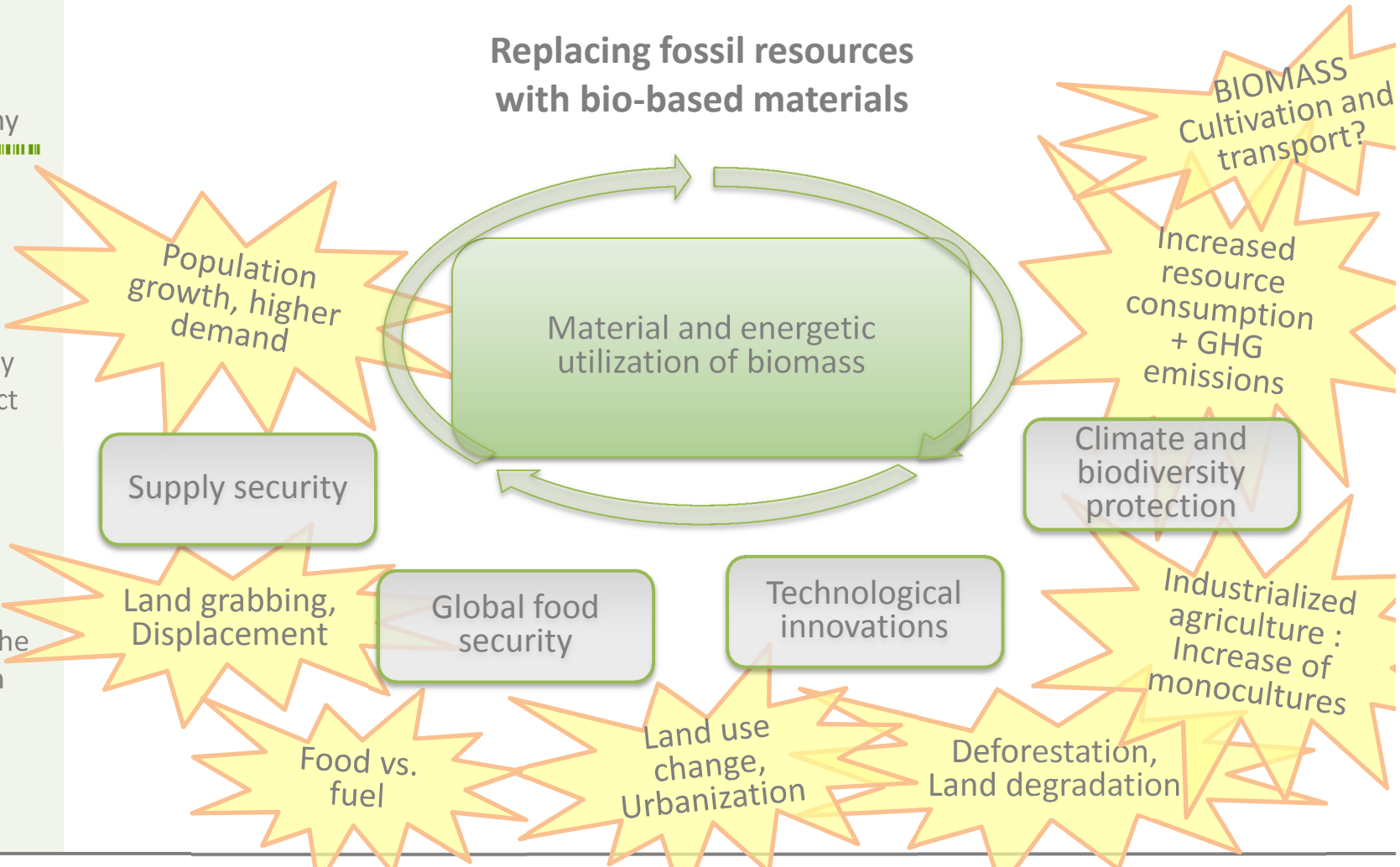
Source:
Alliance for Green Heat, http://www.forgreenheat.org/woodheat/carbon.html

Bioenergy vs. other renewables

Energy from biomass is…

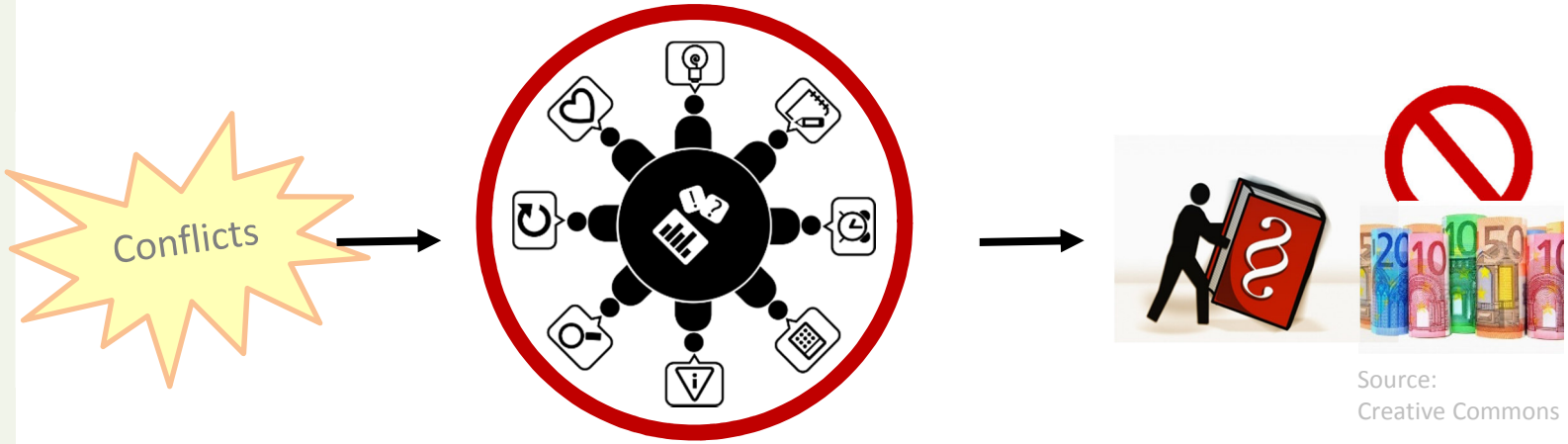
- Storable (solid, liquid, gaseous)
- Transportable
- Convertible to power, heat, mechanical energy
- Flexible
- Base load power
- Limited!

Bioeconomy: Conflicts



Knowledge Gap

- Conflicts of goals in bioeconomy
- Societal and political negotiation processes about acceptable trade-offs
- Result: Policies regulating biomass use
- **Political processes rarely analyzed**



Source: Creative Commons

Our Focus: Political decision processes on policies related to the bioeconomy with ecological relevance

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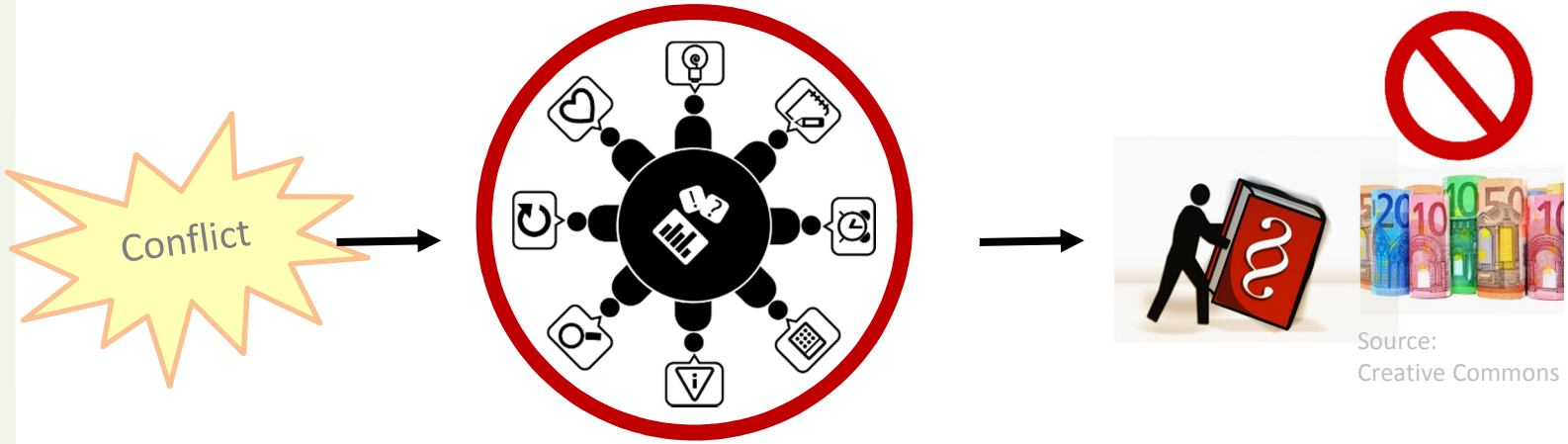
Research Questions

1. Typical patterns? How do they affect policies?
2. Role of environmental effects? Conflicts?
3. How to solve/mitigate these conflicts? Starting points?



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Our Focus: Political decision processes on policies related to the bioeconomy with ecological relevance

Bioeconomy policy case studies

Qualitative comparative **case studies** (n=15)

Case = Policy

= Political measure(s)

Source:
Creative Commons

Bioeconomy policy case studies

Qualitative comparative **case studies** (n=15)

3 thematic fields

- Bioplastics

- Biofuels

- Bioenergy
  Power and Heat

4 territorial levels

5 cases per thematic field

Selected cases bioenergy (power and heat)

Policy	Ebene	Schwerpunkte
Renewable-Energy-Directive 2018 (RED II) der EU	Europäisch: EU	Regulierung erneuerbare Energien in der EU, Umsetzung über nationale Gesetze
Erneuerbare-Energien-Gesetz 2014 (EEG) der Bundesregierung	National: Deutschland	Regulierung erneuerbare Energien im Stromsektor in D
Erneuerbare-Energien-Wärme-Gesetz 2015 (EEWärmeG) der Bundesregierung	National: Deutschland	Regulierung erneuerbare Energien im Wärmesektor in D (Gebäude)
Beschluss des Masterplans 100% Klimaschutz durch den Stadtrat	Kommunal: Magdeburg	Lokale Maßnahmen in den Bereichen Klima, Umwelt, Energie im urbanen Raum
Beschluss des Ökodorfs Sieben Linden zur Registrierung als Bioenergiedorf	Kommunal: Beetzendorf	Lokale Maßnahmen der energetischen Nutzung von Biomasse im ländlichen Raum

Methods

Policy Analysis

Qualitative Methods of Social Research

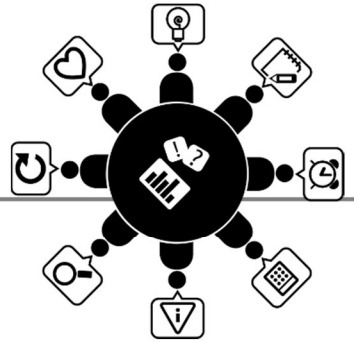
Sources of Data

- Literature / Internet Research
- Expert Interviews
- Transdisciplinary Workshops

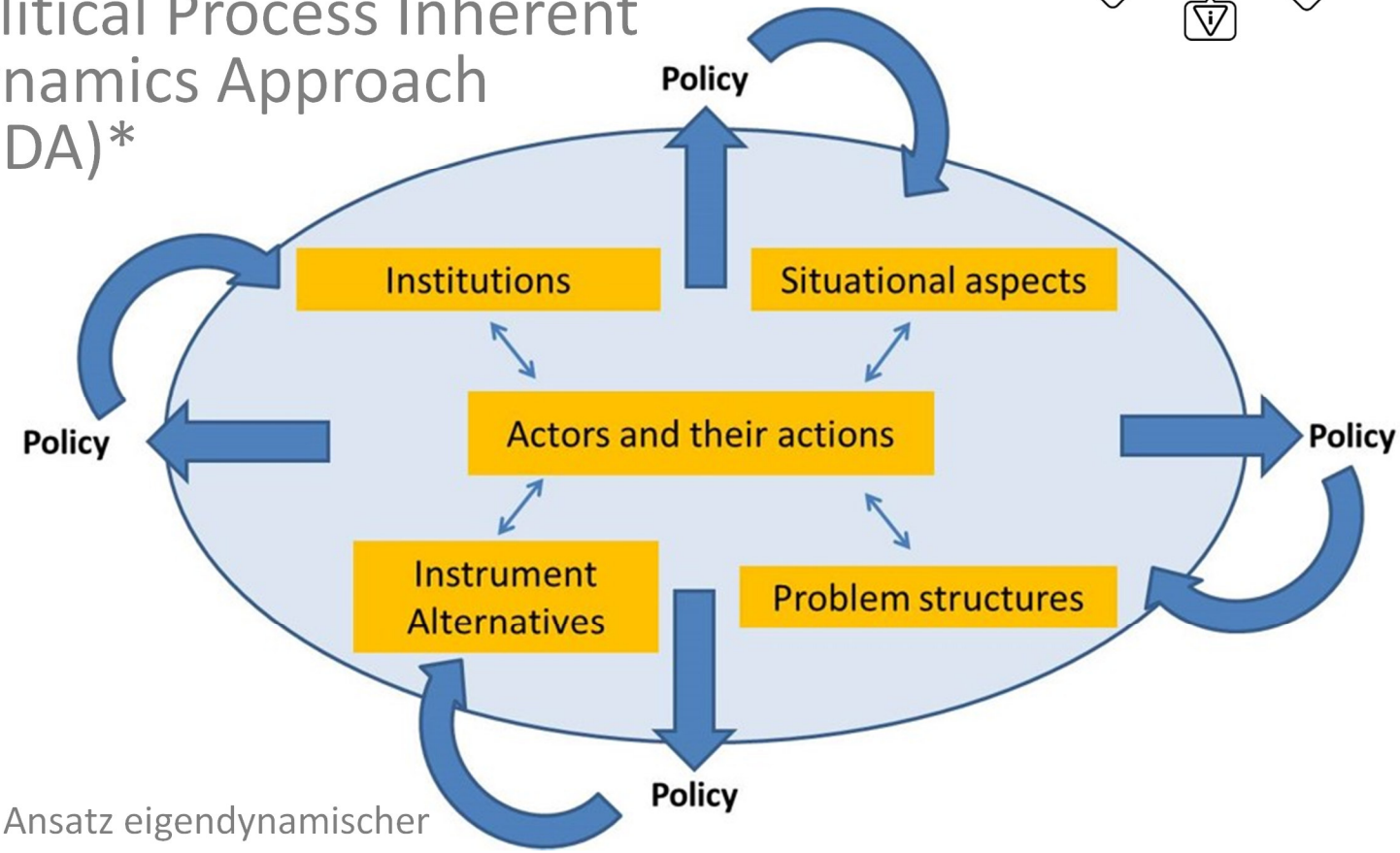
Content Analysis with Theoretical Framework PIDA

Source: Creative Commons

Theoretical Framework



Political Process Inherent Dynamics Approach (PIDA)*



*dt: Ansatz eigendynamischer politischer Prozesse (AEP)

Source: Michael Böcher

Bioenergy and the Lusatia Region

Wood as resource for energy production

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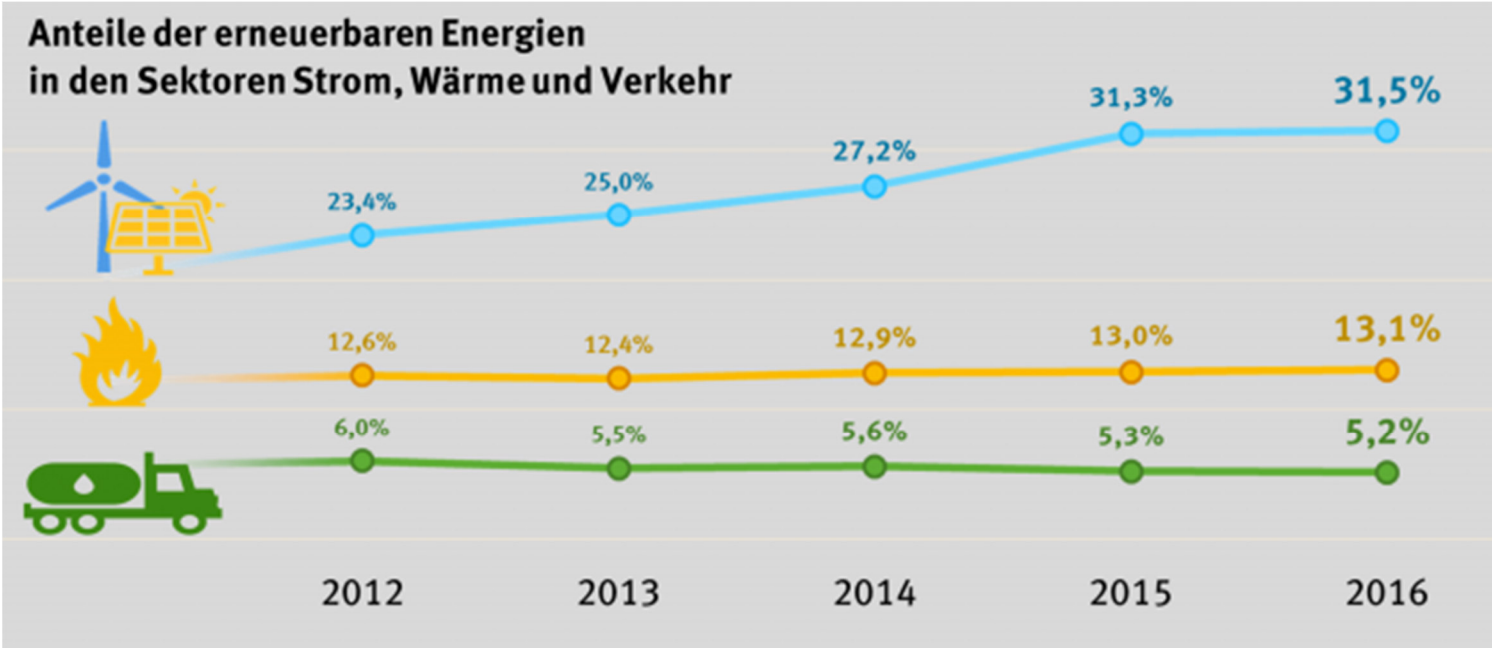
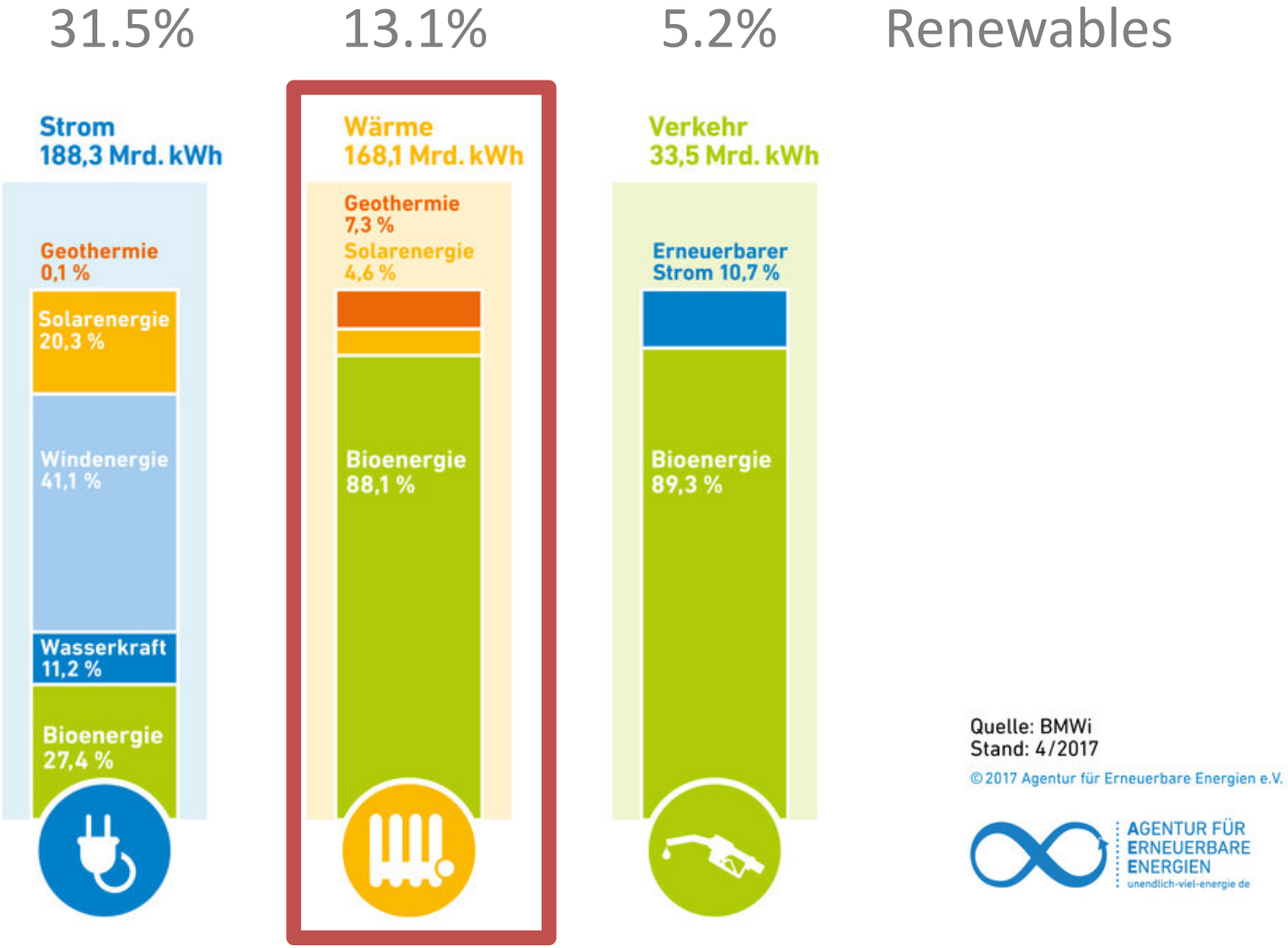
Renewables in Germany in 2016

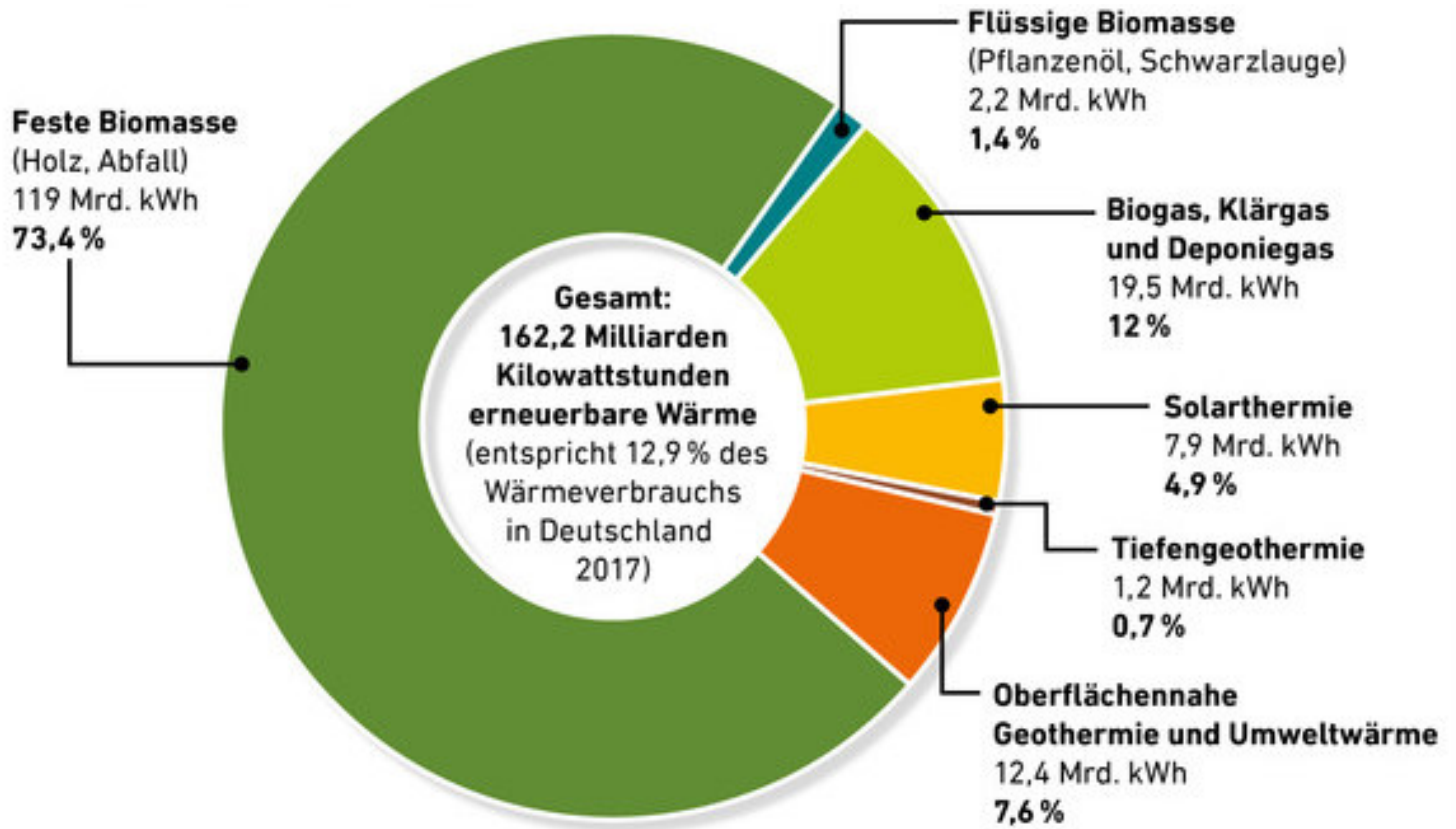


Source: Umweltbundesamt, https://www.umweltbundesamt.de/sites/default/files/styles/800w400h/public/medien/372/bilder/erneuerbare-energien-2016.png?itok=JnC9vFPy

Renewables in Germany in 2016



Renewable heat in Germany in 2017



Quelle: BMWi, AGEE-Stat
Stand: 3/2018
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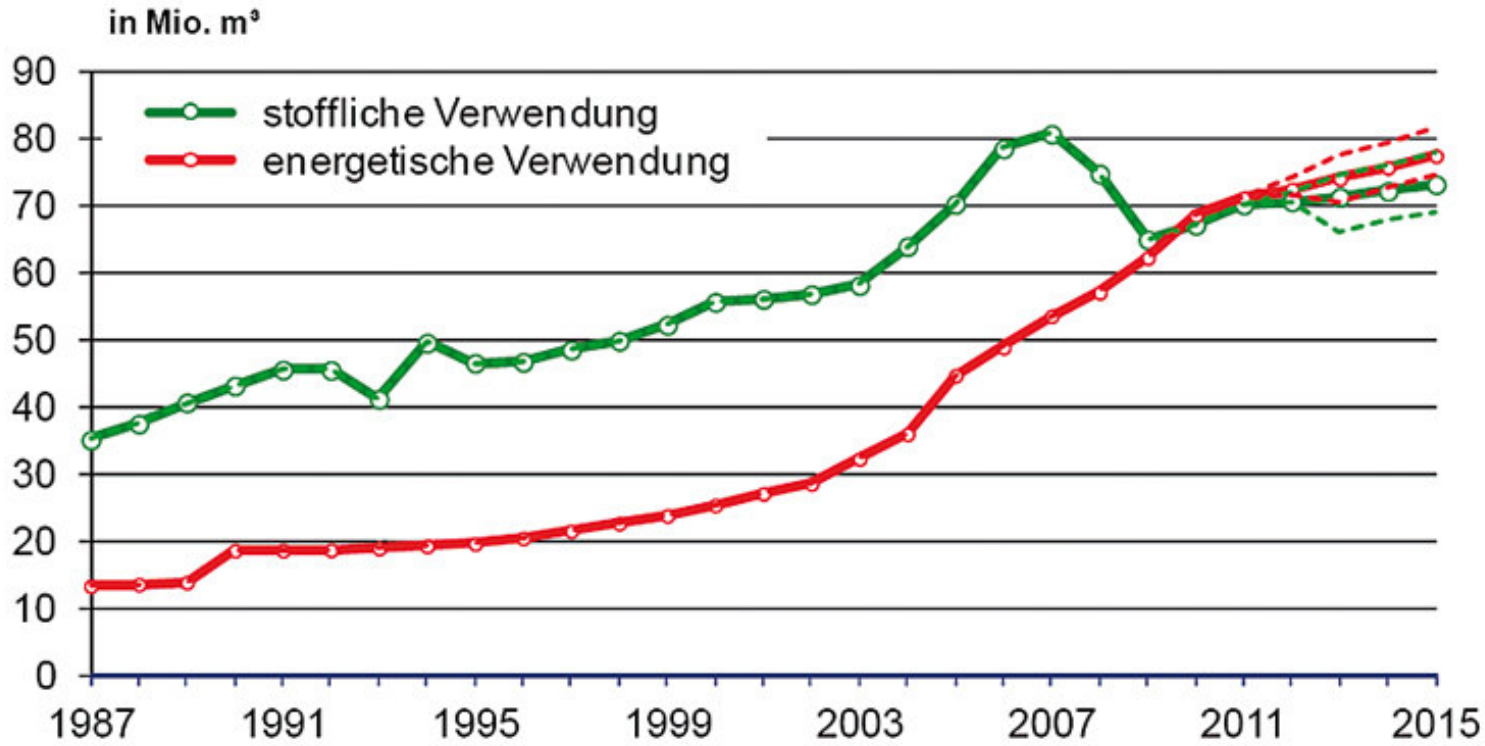
unendlich-viel-energie.de

Energetic vs. Material use of wood

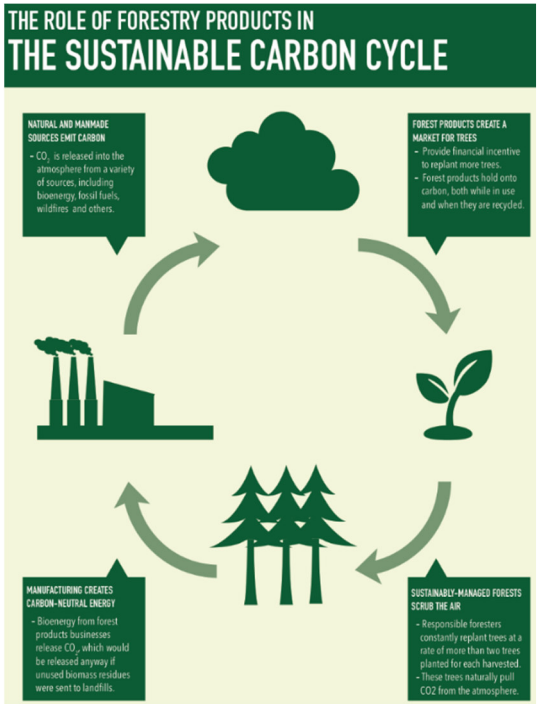


Source: Forstpraxis https://www.forstpraxis.de/wp-content/uploads/2017/06/557959.jpg

- Rising demand for wood
- Rising share of energetic use
- Influence of energy policy

Energetic use of wood

- Germany: Most important source of bioenergy in heat sector
- Globally: By far most important source of bioenergy
- No (direct) competition with food and feed (but indirect)
- Functions of forests: Provision of wood, recreation and health, biodiversity protection, climate protection
- Other sources of wood:
  - Short rotation coppices (SRC)
  - Waste/ residual biomass (maintenance, recycling, by-products)



Source: Biomass101, http://www.biomass101.org/100-year-fallacy-listicle/

Land use: Conflicting demands

Sources of wood for bioenergy production

Waldresthholz und Landschaftspflegeholz	Industrierestholz (Sägespäne, -mehl)	Altholz (bereits stofflich genutztes Holz)
Kurzumtriebsplantagen	Rohholz	
Holzhackschnitzel	Holzpellets	Schredderholz
Scheitholz	Holzbriketts	Source: Agentur für Erneuerbare Energien, http://www.unendlich-viel-energie.de/media/file/317.Renews_Spezial_Holzenergie_Japan_DE_Mar14.pdf

Bilder: AEE, FNR, BAV, C.A.R.M.E.N, TFZ, wendenenergie.de, energie-pflanzen.info

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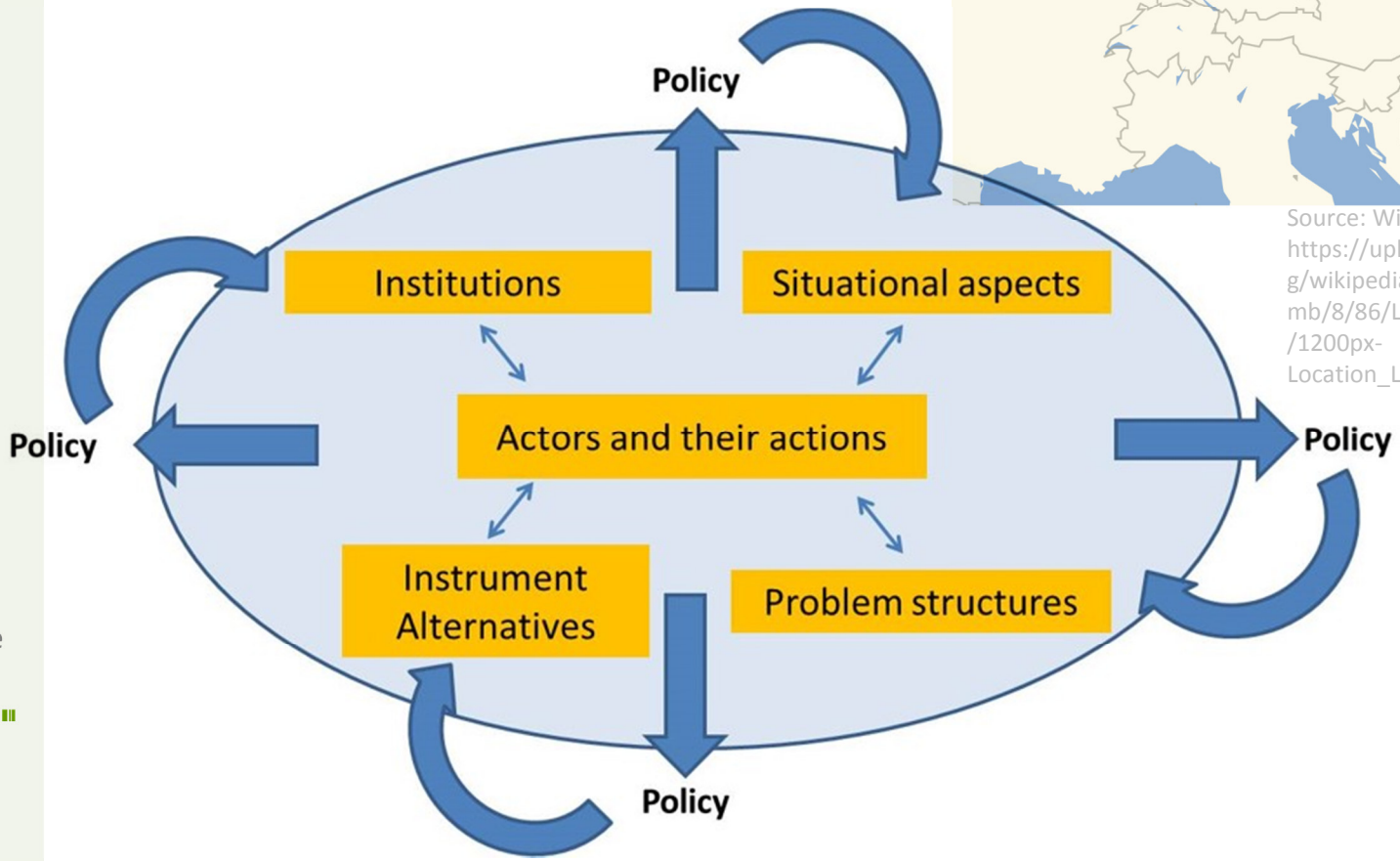
Bioenergy in Lusatia
Focus: Wood

The Bioeconomy

The Bio-Ecopoly Research Project

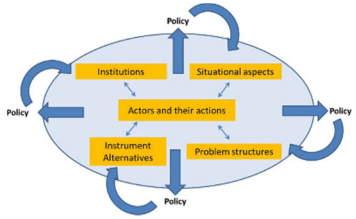
Bioenergy and the Lusatia Region

Source: Wikipedia https://upload.wikimedia.org/wikipedia/commons/thumb/8/86/Location_LUS2.svg/1200px-Location_LUS2.svg.png



Source: Michael Böcher

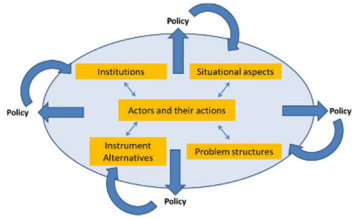
Bioenergy in Lusatia
Problem structure



Background: Potential

- Growing demand for bioenergy
- Good quality of soil for biomass cultivation
- Potential for further expansion of fast-growing timber
- Decentralized bioenergy system: Creation of jobs and added value in the region

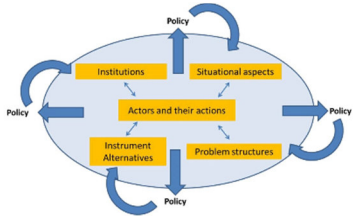
Bioenergy in Lusatia
Problem structure



Background: Current state

- Lignite mining area
- Coal power plants
- Export of electrical energy
- Comparably little added value in the region
- Many employees in fossil energy sector

Bioenergy in Lusatia
Actors and their actions

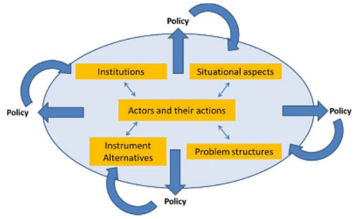


Different perspectives and interests: **-> Political conflicts**

ECONOMY vs. ECOLOGY

- **Economy**: Vattenfall, GMB GmbH, Energieregion Lausitz-Spreewald GmbH,…
- **Ecology**: Environmental organizations,…
- **Civil society**: Employees in lignite sector, citizens,…
- **Politics and administration**: Municipalities, state governments,…
- **Science**: BTU Cottbus-Senftenberg, HS Lausitz, Prognos AG,…

Bioenergy in Lusatia
Instrument alternatives



Power sector

- EEG:

Support of power feeds from wood-fired power plants

Heat sector

- EEWärmeG:

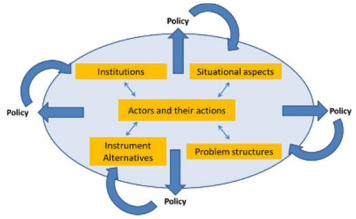
Obligation for new buildings to cover heat demand partly with renewables, e.g.

  - wood-pellet heating systems
  - local heat network with wood-fired power plant

- Marktanreizprogramm (MAP):

Financial support for renewable heat use in existing buildings, e.g. wood-pellet/ wood-chips heating systems

Bioenergy in Lusatia
Instrument alternatives



Norms and certificates

- Pellets: DIN Plus, EU-Norm 14961-2, EN Plus,…
- Small heating plants: DIN EN 14785, DIN EN 13240,…

Agricultural sector

- Common Agricultural Policy (CAP):

Short rotational plantations = ecological compensation areas

Forestry sector, environmental policy, climate policy, local programs, […]

Summary

- Required: Sustainable energy system
- Bioeconomy: Bio-based, knowledge-based economy
- Bioenergy: Advantages compared to other renewables
- Wood in Germany: High relevance in heat sector
- Rising demand for wood, increasing pressure on forests

Potential:

- Wood sources: SRCs, residues, waste
- New technologies

Summary

Lusatia

- Strong lignite sector today
- Energy region: Local expert knowledge
- Soils suitable for wood plantations
- Smooth structural transformation required

Conclusion

-> Legal framework required which supports the shift towards a sustainable economic system in the region and solves/mitigates conflicting interests

What could it look like?

Bio-Ökopoli

Contact

Political Processes of Bioeconomy between Economy and Ecology

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Sources

Literature sources

BMBF (2011): National Research Strategy BioEconomy 2030. Our Route towards a biobased economy, available at: https://www.bmbf.de/pub/National_Research_Strategy_BioEconomy_2030.pdf [2018-06-05]

BMBF/ BMEL (2015): Bioeconomy in Germany. Opportunities for a bio-based and sustainable future. Bonn, Berlin, available at: https://www.bmbf.de/pub/Biooekonomie_in_Deutschland_Eng.pdf [2018-06-05]

FernUniversität Hagen (2017): Politische Prozesse der Bioökonomie zwischen Ökonomie und Ökologie - Bio-Ökopoli. Project homepage, available at: www.bio-oekopoli.de/ [2018-06-05]

Kaltschmitt, Martin; Hartmann, Hans; Hofbauer, Hermann (Eds.) (2016): Energie aus Biomasse. Grundlagen, Techniken und Verfahren. 3., aktualisierte Auflage. Berlin, Heidelberg: Springer Berlin Heidelberg (SpringerLink : Bücher).

Kleinschmit, D. et al. (2014): Shades of green. A social scientific view on bioeconomy in the forest sector. In: Scandinavian Journal of Forest Research 29(4), 402–410.

OECD (2009): The Bioeconomy to 2030: Designing a Policy Agenda. Paris, available at: http://www.oecd.org/futures/long-termtechnologicalsocietalchallenges/thebioeconomyto2030designingapolicyagenda.htm [2018-06-05]

Ollikainen, Markku (2014): Forestry in bioeconomy – smart green growth for the humankind. Scandinavian Journal of Forest Research 29 (4): 360–366. doi: 10.1080/02827581.2014.926392.

Sources

Literature sources

Prognos AG (2013): Kompetenzfeldanalyse im Zukunftsdialog Energieregion Lausitz. Kurzfassung des Endberichts. Studie im Auftrag von Energieregion Lausitz-Spreewald GmbH, available at: http://energieregion-lausitz.de/visioncontent/mediendatenbank/kompetenzfeldanalyse_kurz.pdf [2018-06-05]

Prognos AG (2008): Die Lausitz als Energieregion. Studie im Auftrag von Vattenfall Europe Mining & Generation, available at: http://braunkohle-forum.de/files/prognos_studie_ve_okt_2008_p02151841.pdf [2018-06-05]

Sillanpää, M. and Ncibi, C. (2017): A Sustainable Bioeconomy. The Green Industrial Revolution. Cham: Springer International Publishing.

UN (2017): Affordable and green energy: Why it matters, available at: http://www.un.org/sustainabledevelopment/wp-content/uploads/2016/08/7_Why-it-Matters_Goal-7_CleanEnergy_2p.pdf [2018-06-05]

UN (2016): Progress towards the Sustainable Development Goals. Report of the Secretary-General, E/2016/75, available at: https://unstats.un.org/sdgs/files/report/2016/secretary-general-sdg-report-2016--EN.pdf [2018-06-05]

Sources

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