Brandenburgische Technische Universität Cottbus - Senftenberg

Brandenburg University of Technology

Chair
Management of Regional Energy Systems

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BTU Cottbus-Senftenberg

Brandenburgische Technische Universität Cottbus - Senftenberg

FACULTY 1

Mathematics, Computer Science, Physics, Electrical Engineering and Information Technology

FACULTY 2

Environment and Natural Sciences

FACULTY 3

Mechanical Engineering, Electrical and Energy Systems

FACULTY 4

Social Work, Health Care and Music

FACULTY 5

Business, Law and Social Sciences

FACULTY 6

Architecture, Civil Engineering and Urban Planning

7,600 Students

2,000 from abroad

BTU Library in Cottbus

Seminar room in Senftenberg

Lusatia: a living-lab for the German „Energiewende“

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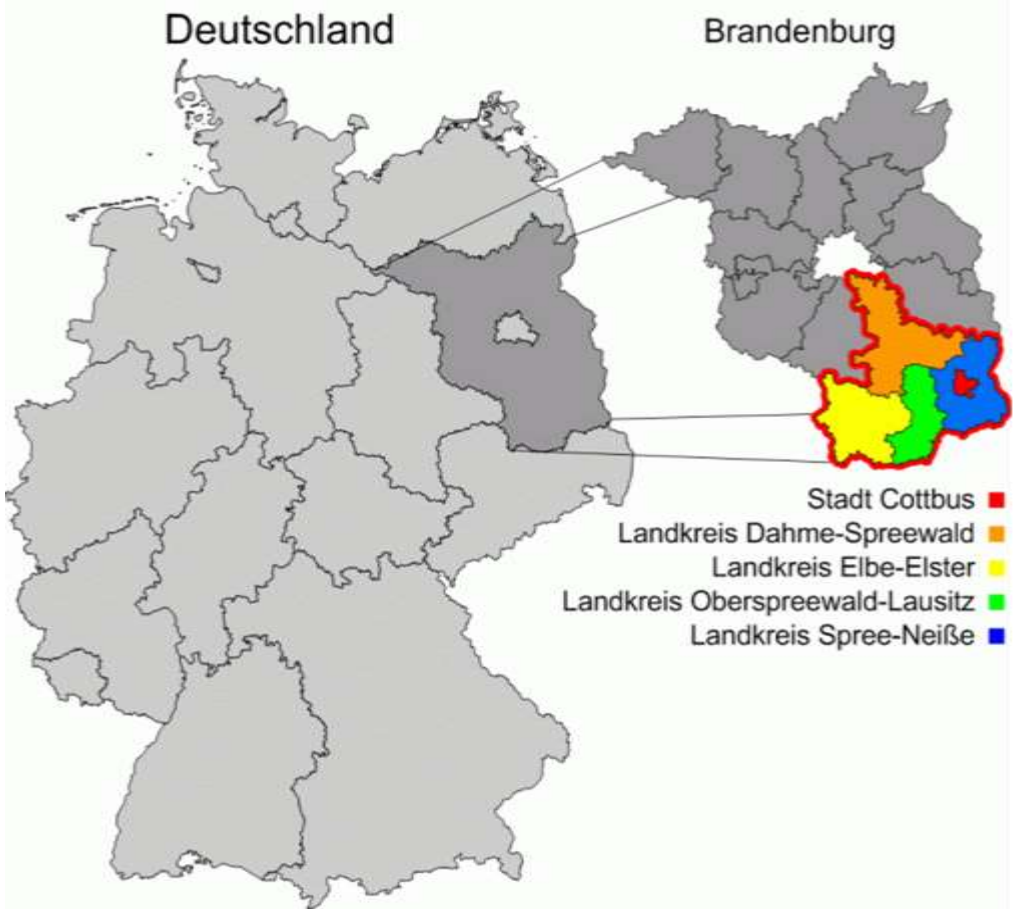

Source: www.ascori.de

Expertise MarEs

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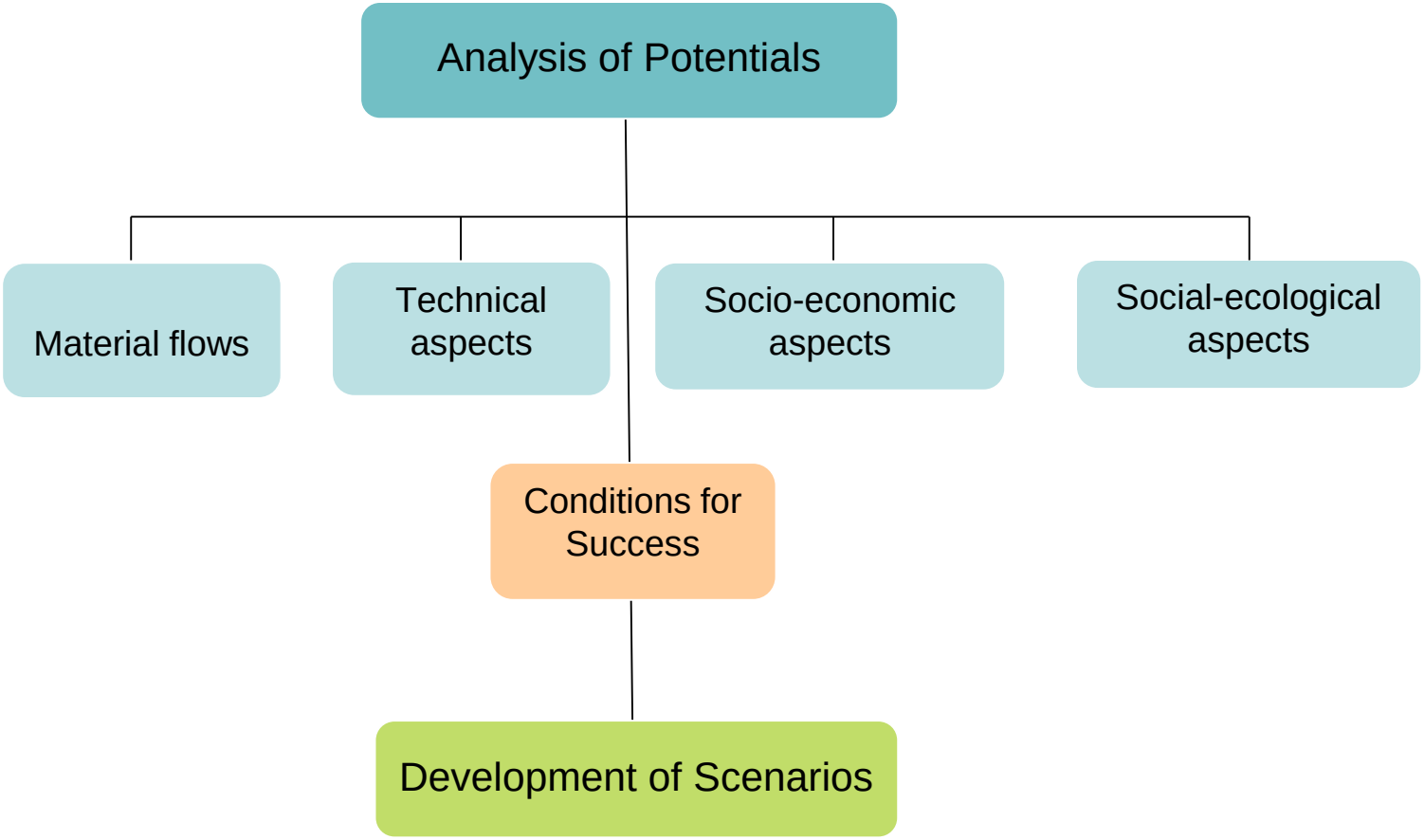
- Development and evaluation of energy and climate protection concepts and strategies
- Sustainability assessment of technologies and markets in the energy sector
- Analysis of the socio-economic effects of renewable energies
- Social and ecological aspects of energy generation
- Development of scenarios for decentralized energy generation
- Strong cooperation with the Institute for Ecological Economic Research (IÖW) in Berlin

Source: https://www.bundesnetzagentur.de/

Source: B. Leuner, 2012

INSTITUT FÜR ÖKOLOGISCHE WIRTSCHAFTSFORSCHUNG

Interdisciplinary Approach



Why Brazil?

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- Agricultural and forestry residues in Brazil have a great energetic potential
- Sugar cane bagasse: 77% of bioelectricity production in Brazil (ANEEL, 2017)
- **Other biomass residues?**
- High availability but limited use for local and decentralized energy generation
- Which options do exist for rural areas?
- How the biomass potential can be assessed economically and ecologically?

Source: Missagia, 2012

Source: Missagia, 2012

The Bioeconomy Strategy

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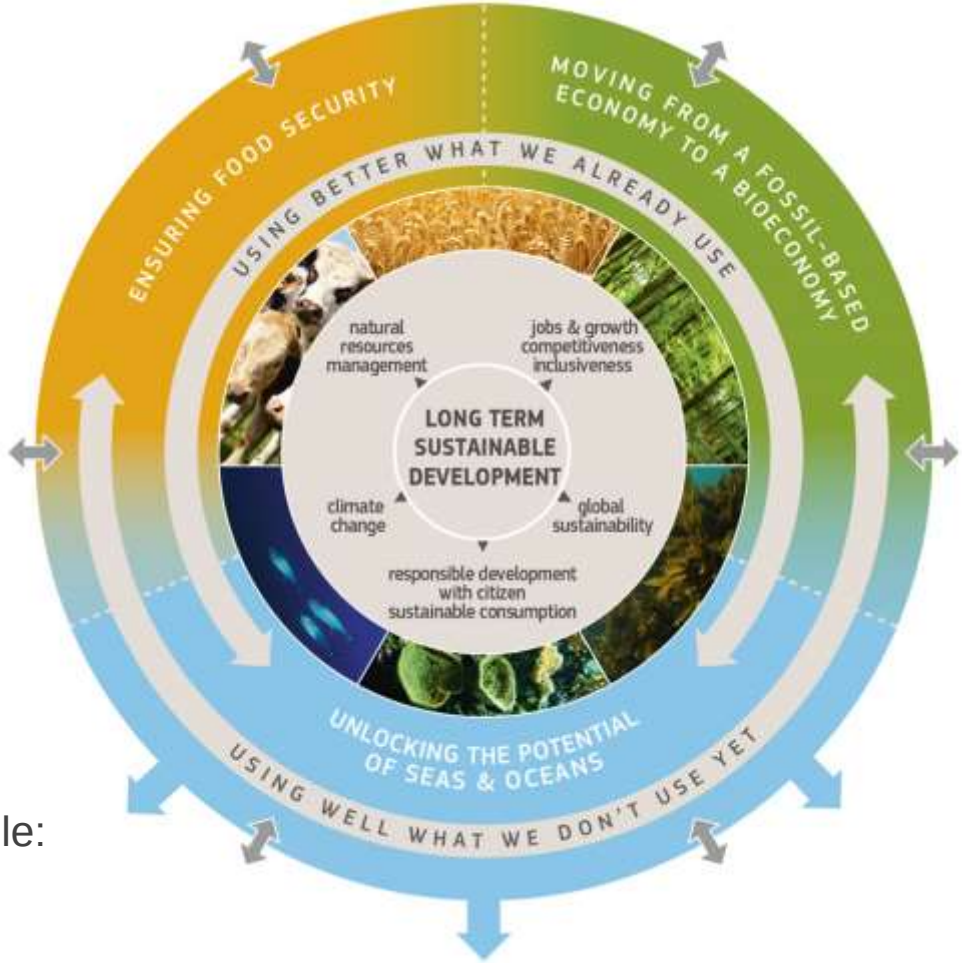
- Since 2012, the EC "Bioeconomy“ strategy has the major challenges:
  - nutrition,
  - climate change,
  - biodiversity,
  - soil fertility
- It is a mix of high-tech strategy and sustainability
- It fosters the empowerment of local economies
- It has the recycle and cascade principle: value-chains



Source: https://ec.europa.eu/research/bioeconomy/images/bioeconomy_graphic_full.jpg

Bioeconomy value-chains

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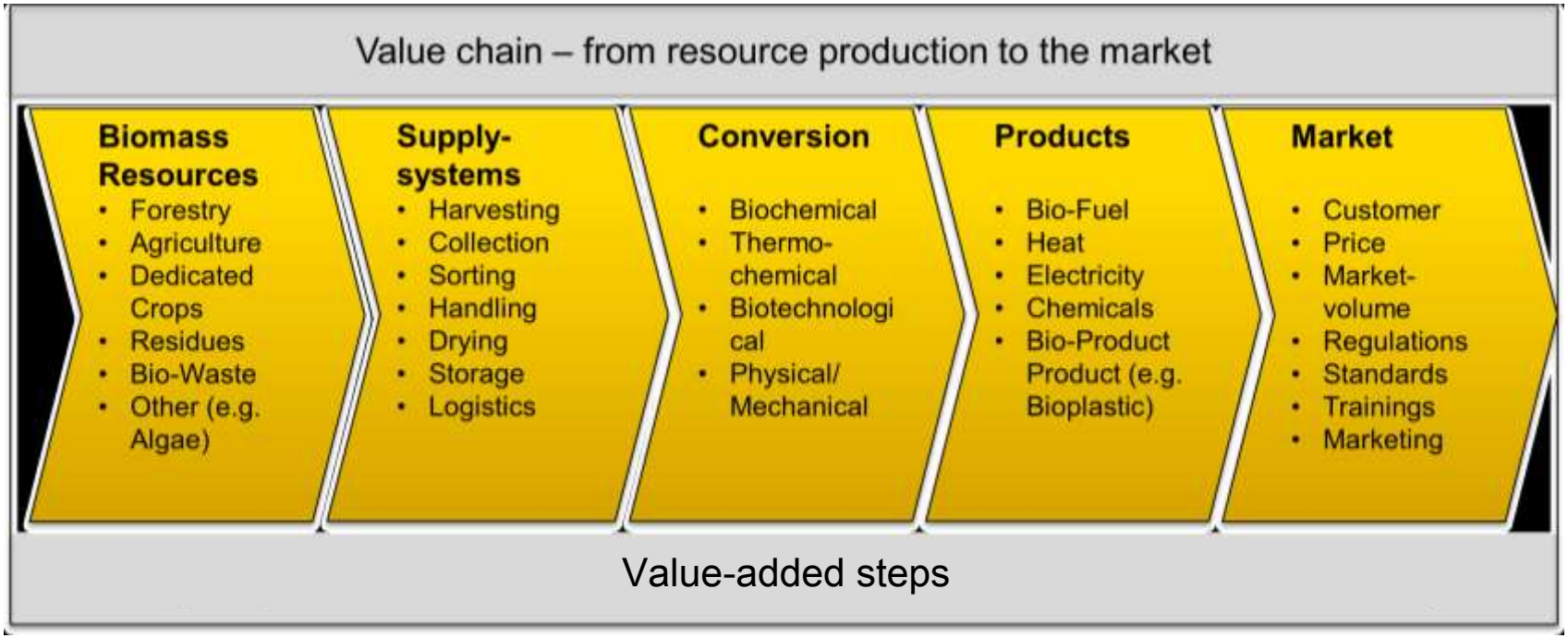
What are the **effects** of bioeconomy value-chains in rural areas?



Source: Adapted from https://www.bioenergy2020.eu/en/competence_areas/supplychain/overview

Stakeholders involved

Sources: ifok 2012, ifeu 2015, Difu 2015
as of: 4/2016
© Agentur für Erneuerbare Energien e.V.

RENEWABLE ENERGIES AGENCY

Typical municipal stakeholders in development process of local energy generation.

Source: https://www.unendlich-viel-energie.de/media-library/charts-and-data?page=2

Investigation of the value-added for renewable energies

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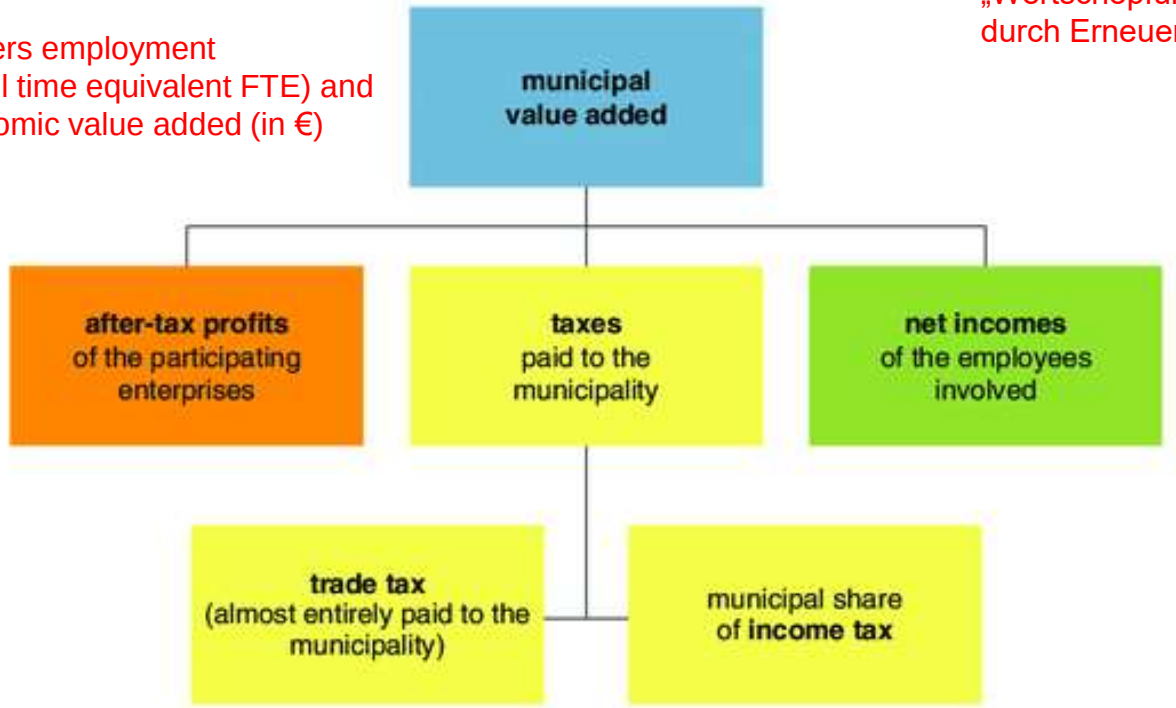
The WeBEE Model

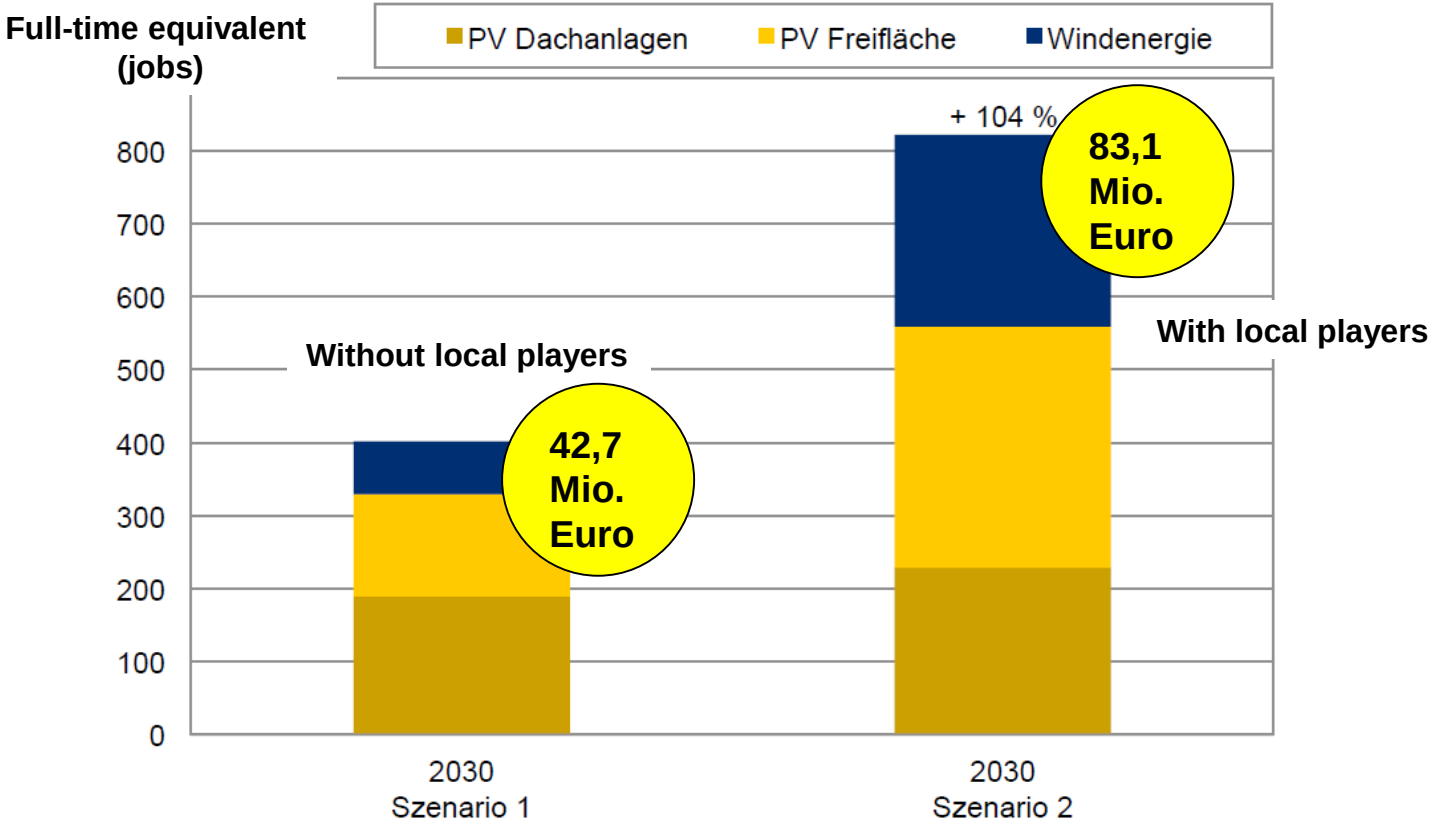
„Wertschöpfung und Beschäftigung durch Erneuerbare Energien“

delivers employment
(in full time equivalent FTE) and
economic value added (in €)



Source: Heinbach et al. Energy, Sustainability and Society 2014, 4:1 Page 4 of 10

Value-added and employment generation through PV and Wind



Source: Heinbach et al. 2017, Greenpeace Study “Value-added and employment effects through the implementation of renewable energies in Lusatia”

Adapting the WeBEE Model to Brazil

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- The WeBEE Model **can be adapted** to reflect the Brazilian bioeconomy, for all or a selection of value chains.

- Transferring the model to Brazilian conditions, need the analysis of:
  - Cost structures
  - National and regional economic indicators
  - Structural data
  - Special indicators like informal economy and environmental conflicts

- The model can be applied at national and regional level, e.g. model region

- Application:

  - Development of information material on regional socio-economic benefits

  - Development of a simplified online tool for local actors in order to assess the regional socio-economic effects of local development of bioenergy.

References

- Hirschl et.al (2015) Wertschöpfung durch Erneuerbare Energien: Ermittlung der Effekte auf Länder- und Bundesebene https://www.ioew.de/fileadmin/user_upload/BILDER_und_Downloaddateien/Publikationen/Schriftenreihen/IOEW_SR_210_Wertsch%C3%B6pfung_durch_erneuerbare_Energien_auf_Landes-_und_Bundesebene.pdf
- Heinbach et.al (2015) Value-added by PV installations in the Netherlands: a modeling approach. In: 33rd European Photovoltaic Solar Energy Conference and Exhibition
- Heinbach et al. (2014) Renewable energies and their impact on local value-added and employment. In: Energy, Sustainability and Society, Springer
- Hirschl et.al (2012) Effekte der Ausbaupläne für Erneuerbare Energien bis 2020 auf Arbeitsplätze und Wertschöpfung: Kurzstudie im Auftrag von Greenpeace Deutschland, Hamburg https://www.ioew.de/fileadmin/_migrated/tx_ukioewdb/Effekte_der_Ausbauplaene_fuer_EE_bis_2020_auf_Arbeitsplaetze_und_Wertschoepfung.pdf
- Missagia, B. (2012) Agricultural and forestry residues for decentralized energy generation in Brazil. Dissertation. Südwestdeutscher Verlag für Hochschulschriften

Thank You!

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