Jordan's future power supply – development of scenarios in a collaborative approach

MENA SELECT research project

Conference:
„100% Climate Neutrality – Solutions for Crossing Borders"
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ZNES
Zentrum für nachhaltige Energiesysteme
Hochschule | Europa-Universität Flensburg

Sönke Bohm
Research assistant

Agenda

- The MENA SELECT research project
- Our participatory approach
- Collaborative development of scenarios in Jordan
- Experiences from our workshops
- Summary, conclusion and outlook

MENA SELECT – background I

Research project:

Middle **E**ast **N**orth **A**frica **S**ustainable **Elec**tricity **T**rajectories

Funded by the German Federal Ministry for Economic Cooperation and Development (BMZ)

Period: 2015-2018

EUF

MENA SELECT – background II

Our aim in the research project:

- Development of consistent scenarios for the future power supply of Morocco, Jordan and Tunisia by local stakeholders
- Utilization and distribution of EUF's simulation model *renpassG!S* and a simplified spreadsheet model, respectively

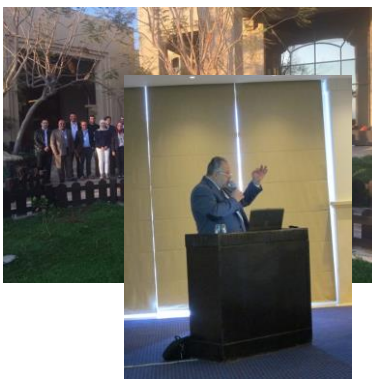
Overall project objectives:

→Support the discussion in the project countries about their future power systems

→Enable the local civil society to take part in this discussion

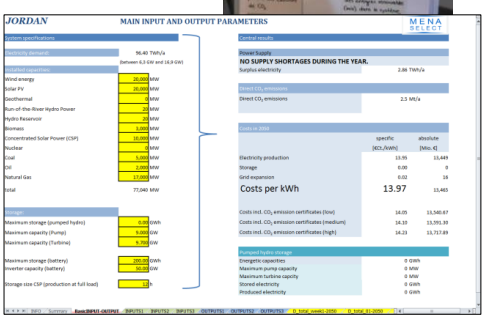
Our participatory approach I

- Workshops in the project countries
- Invite local stakeholders: heterogenous group of approx. 25 representatives of various societal groups
- Challenge:
  attract potential participants to attend the workshops
- Invitation through a local partner
- Input talk from a high representative
- Moderation of the discussions supported by a local partner



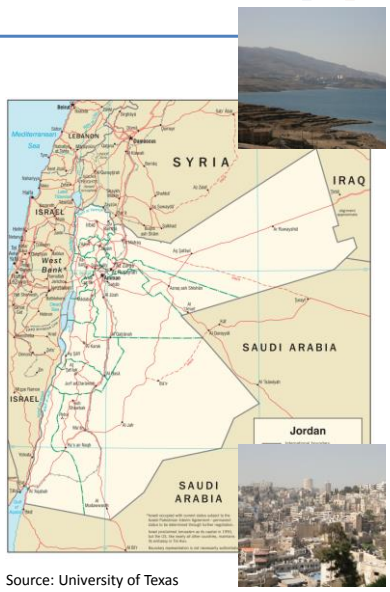
Collaborative development of scenarios I

- At the beginning of the workshop:
  ask the workshop participants for their aims and expectations for Jordan‘s future power system (2050)
  → “storyline“
- Spreadsheet model:
  - start with mid-term goals, i.e. capacities
  - compare with 2050 load curve
  - adjust capacities until the load is covered in every hour of the year 2050



Collaborative development of scenarios II

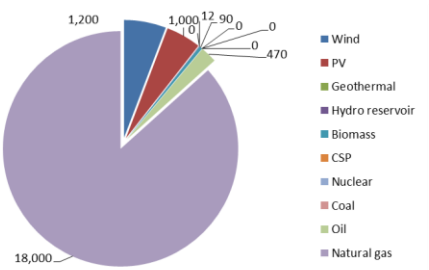
- Key figures on Jordan:
  - 9.7 Mio. inhabitants
  - Refuge
  - 90,000 km² of size
  - Water scarcity
  - Power system:
    - Today mainly based on natural gas
    - Few domestic fossil resources
    - Nuclear power discussed
    - RE in the upswing
    - Excellent solar resourse
    - Annual demand 2050: 106 TWh



Source: University of Texas

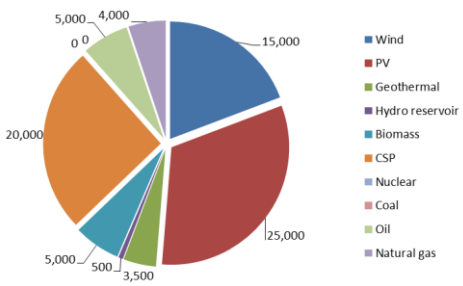
Two exemplary scenarios

Scenario B



Installed capacity	20,772 MW
Electricity production	110 TWh
Electricity demand	106 TWh
Share of RES (energy)	4.5 %
CO_2 emissions	26.7 Mt
System costs	**9.52 Ct./kWh**

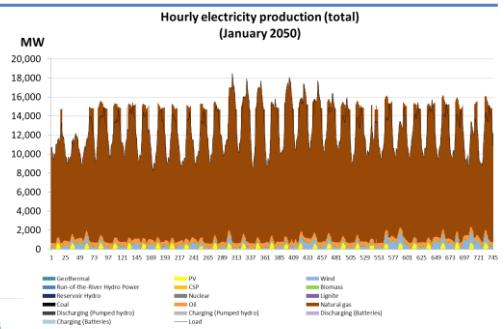
Scenario F

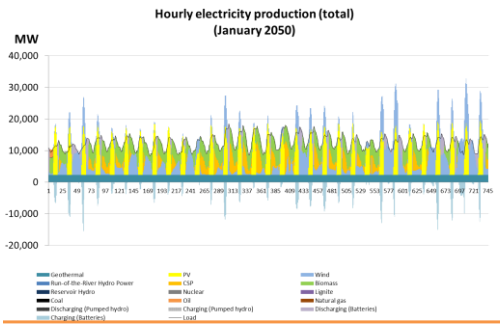


Installed capacity	78,000 MW
Electricity production	117 TWh
Electricity demand	106 TWh
Share of RES (energy)	101.8 %
CO_2 emissions	0.26 Mt
System costs	**28.19 Ct./kWh**

Workshop results – scenarios

Scenario B: “Natural gas”





Scenario E: “No imports“

Experiences from our workshops

- Conducting the workshops on-site is key
- Invitation process and workshop organization with local partners is key
- Great discussions below workshop participants (different views, explanations, …)
- The scenarios developed sometimes corresponded to various “storylines“ stated at the beginning of the workshop
- Lesson learnt: storyline “low cost“ is a given

Summary, conclusion and outlook

- Results from discussions and scenarios:
  - Wide range of scenarios conceivable
  - 100% RES in Jordan alone is technically possible but presumably a great challenge to implement
  - Problem awareness is available with local stakeholders
- Capacity building conducted on-site
- Collaborative scenario development can support the national discussion about long-term and intermediate targets (RES shares, demand level, energy independence etc.) towards climate neutrality

Thank you for your attention!

Sönke Bohm

Zentrum für nachhaltige Energiesysteme (ZNES)
Universität Flensburg
Munketoft 3b
24937 Flensburg

Telefon: +49 (0) 461 805 3014
Fax: +49 (0) 461 805 2532

E-Mail: soenke.bohm@uni-flensburg.de

Web: www.uni-flensburg.de/eum
www.znes-flensburg.de
www.menaselect.info

ZNES
ZENTRUM FÜR NACHHALTIGE ENERGIESYSTEME
HOCHSCHULE | EUROPA-UNIVERSITÄT FLENSBURG