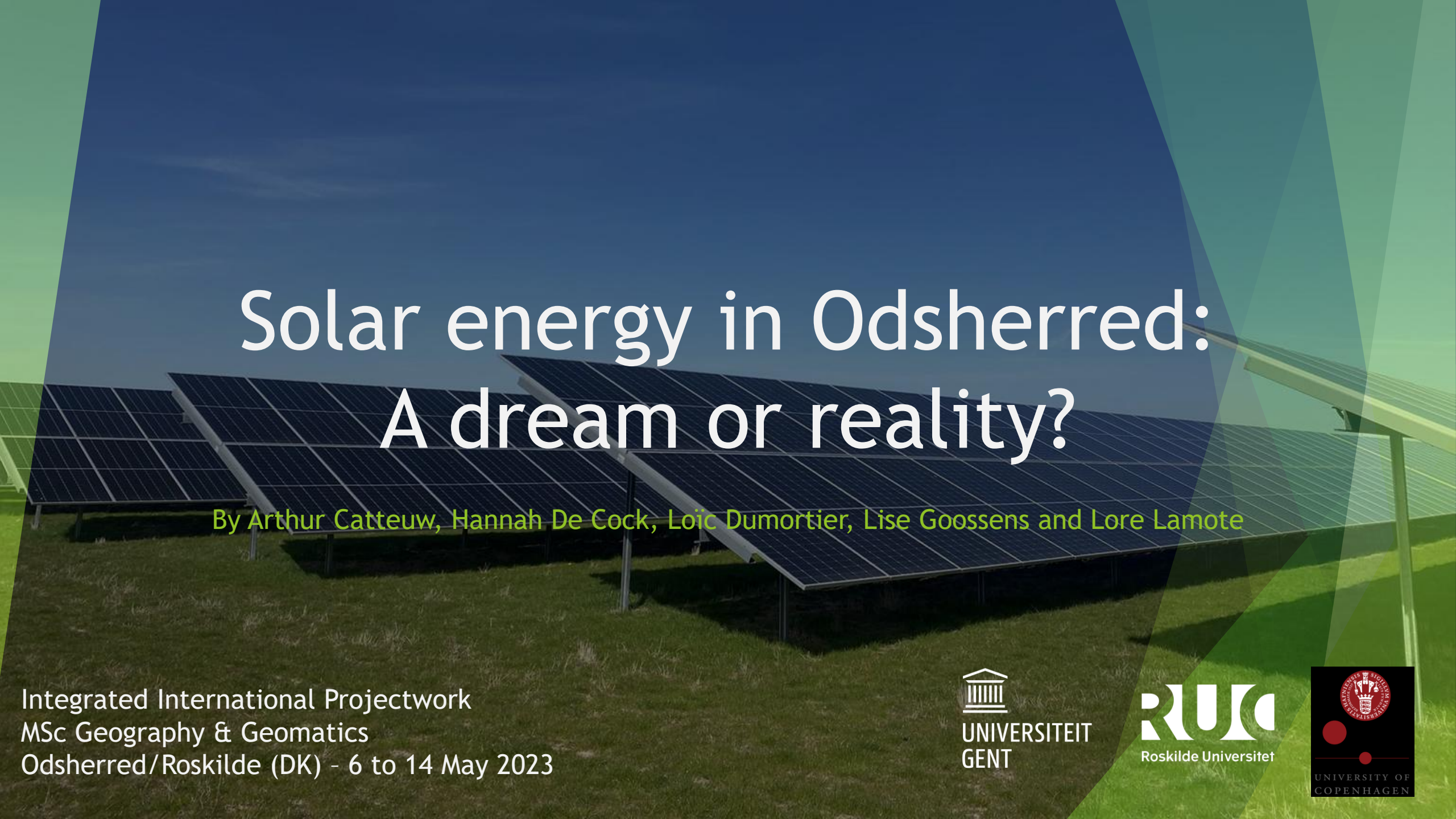

Solar energy in Odsherred: A dream or reality?

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Integrated International Projectwork
MSc Geography & Geomatics
Odsherred/Roskilde (DK) – 6 to 14 May 2023

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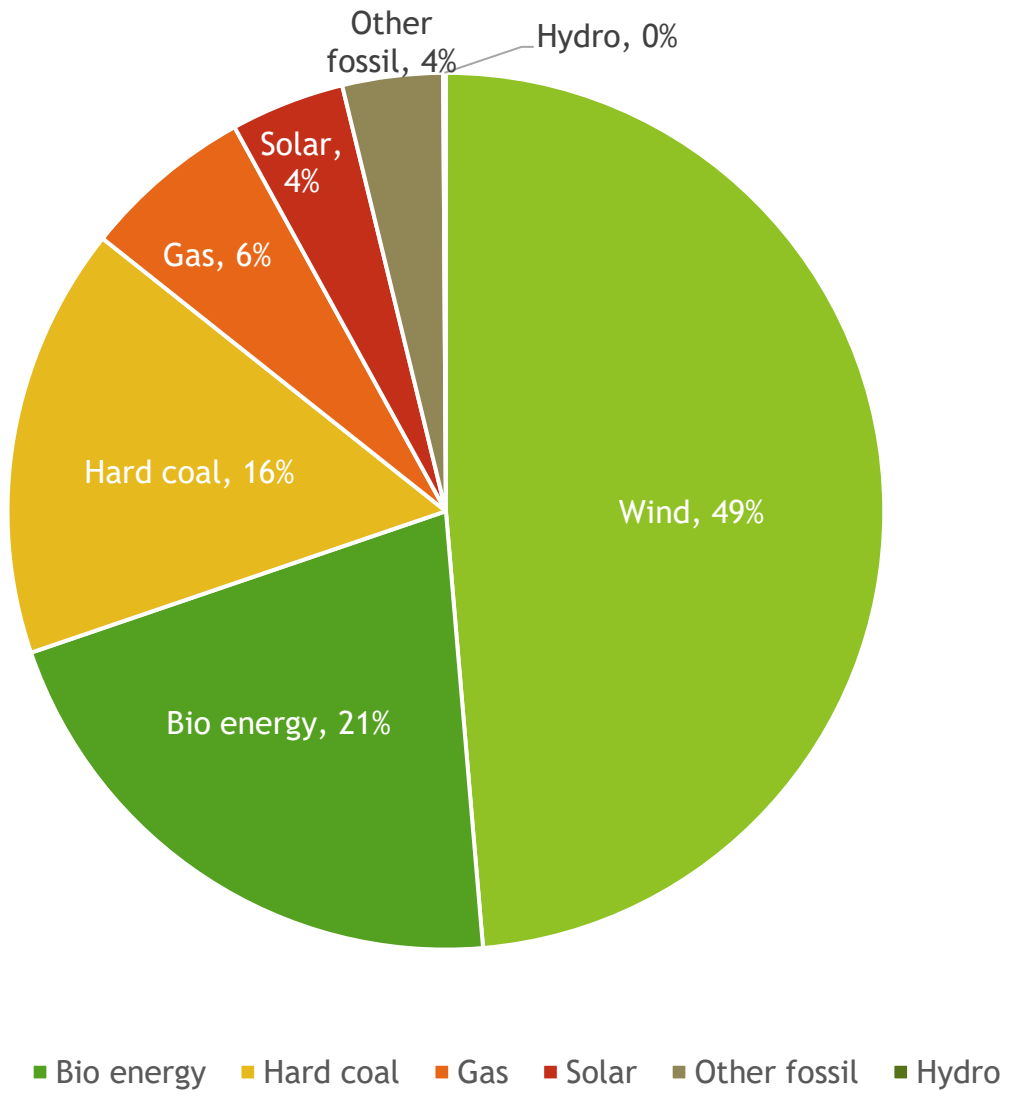
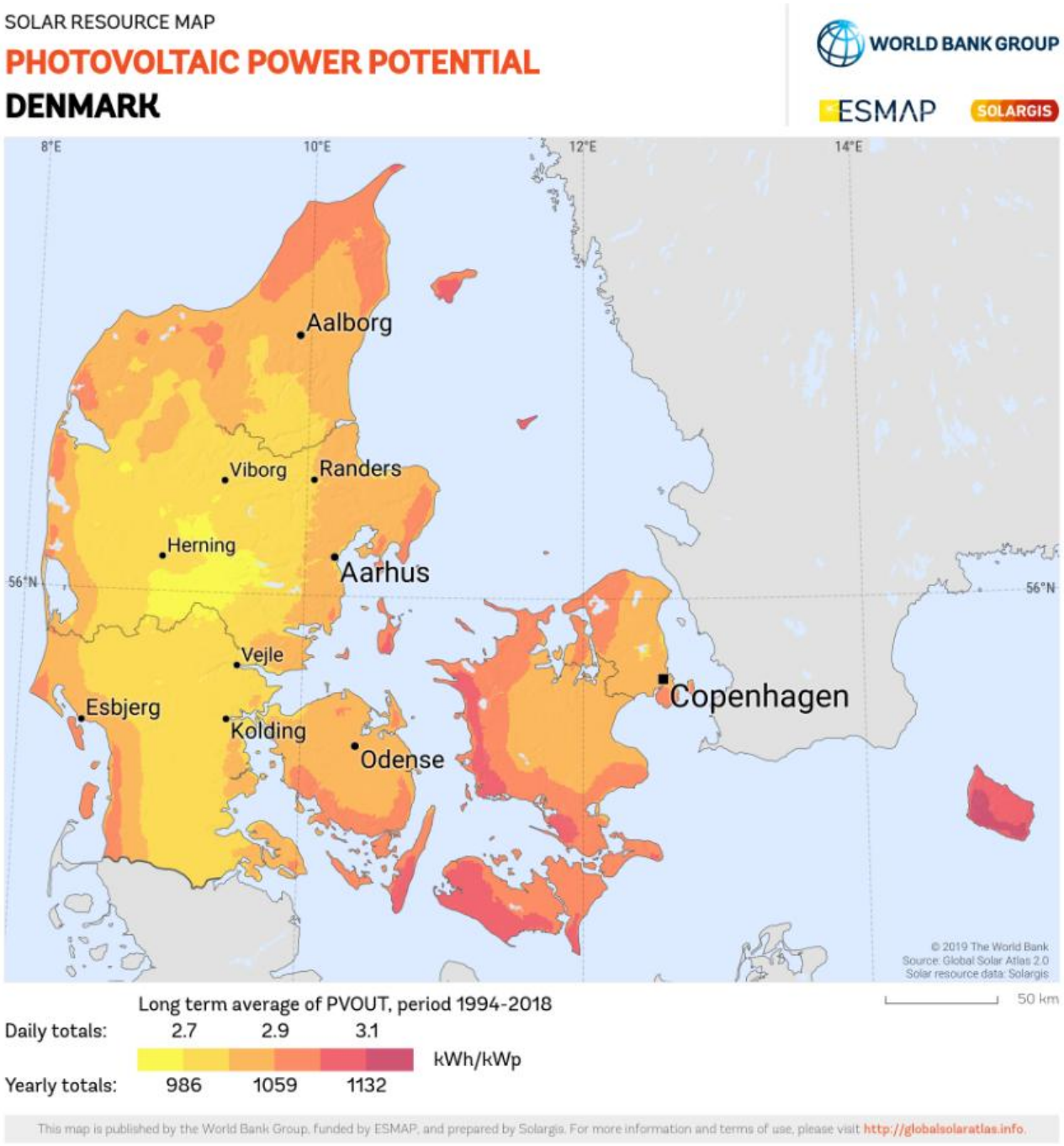
Current Situation Denmark



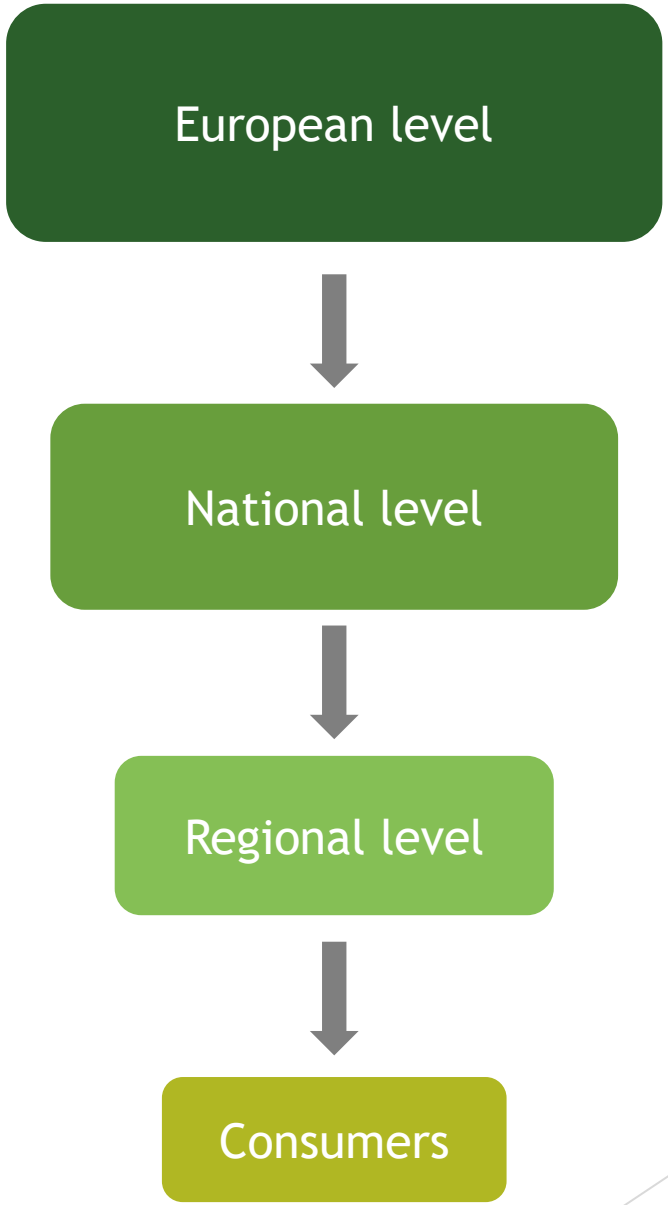
- Global leading role
- Wind + solar > 50%
- 2045: Net-zero emissions target
- Diversification of energy sources



Current Situation Denmark

Regulations

- Top-down system
  - Regulations are too broad
- No proper regional & national regulations
  - Plausible locations
- Time-consuming
  - Building permit
- Subsidies are decreasing
- Solar farms from private companies
  - Government has no legislation on this



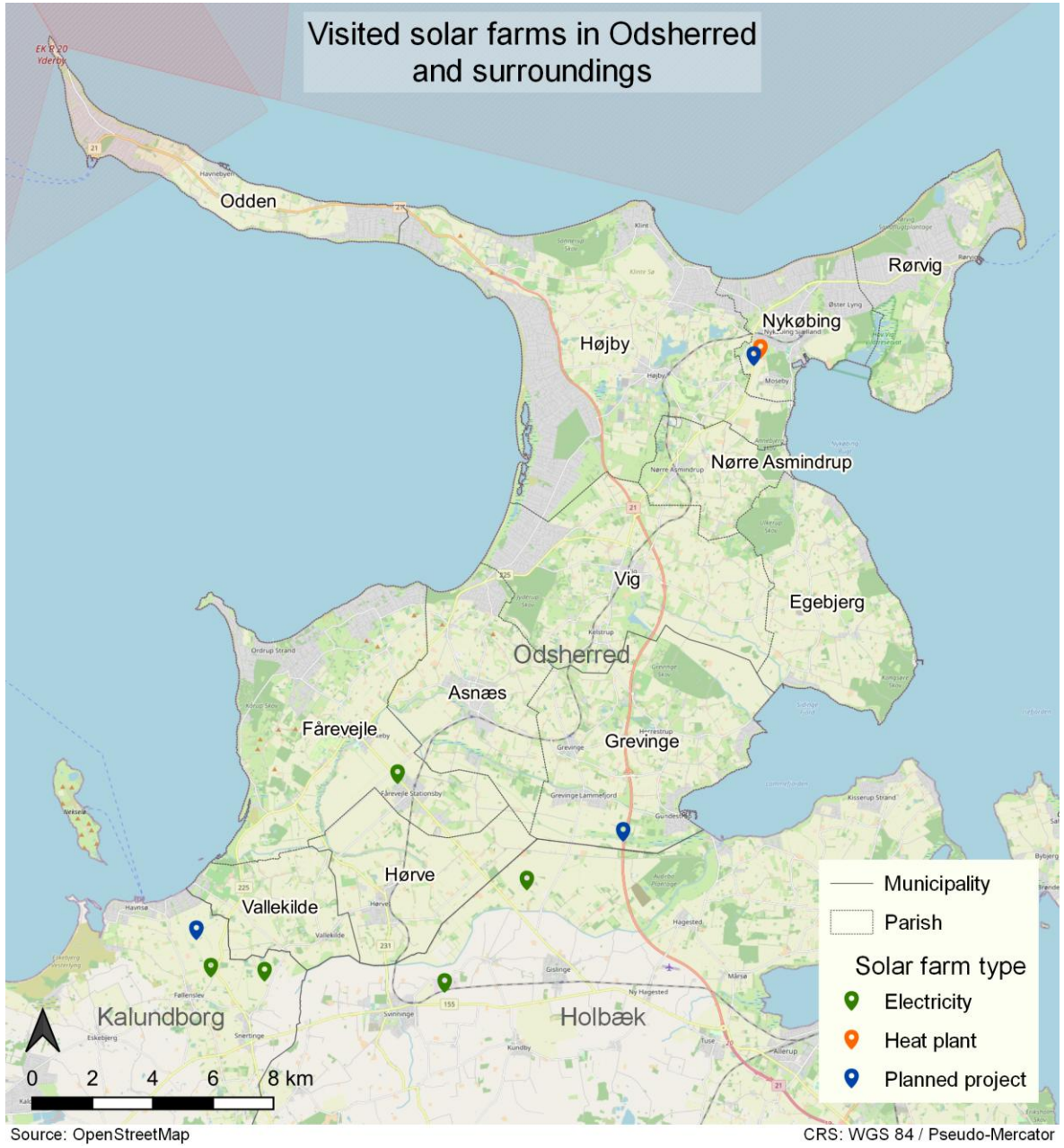
The need of a further diversification of energy sources and possibilities

- The current situation regarding solar energy in Odsherred
- Requirements for suitable locations for a solar farm
- Current solar farms location and comparing this with the suitability map
- Multifunctional use

Research Questions

How can solar farming become a major energy producer for Odsherred, just like wind energy became for Denmark?

- What are the current regulations around solar farming in Denmark? (literature)
- Which different kind of solar farms exist in Denmark and what are similarities and dissimilarities between them?
- What are the terrain requirements to designate a land piece for solar farming?
- What are suitable places and interesting projects concerning solar farms in Odsherred?
- What is the public opinion concerning solar farms in Odsherred?
- How can multifunctionality be implemented in solar farms?



Study Area

Odsherred:

- Only a few solar heating installations
- Planning to make a large solar farm
- Odsherred does less than surrounding municipalities

Methods

Literature study

- Study area of Odsherred
- Current situation
- Regulations
- Types of energy producers
- Energy landscapes

Suitability map

- Multi-criteria evaluation
- Economic factors:
  - Closeness to the road network
  - Closeness to electrical substations
- Physical factors:
  - Insolation
  - Slope
  - Aspect

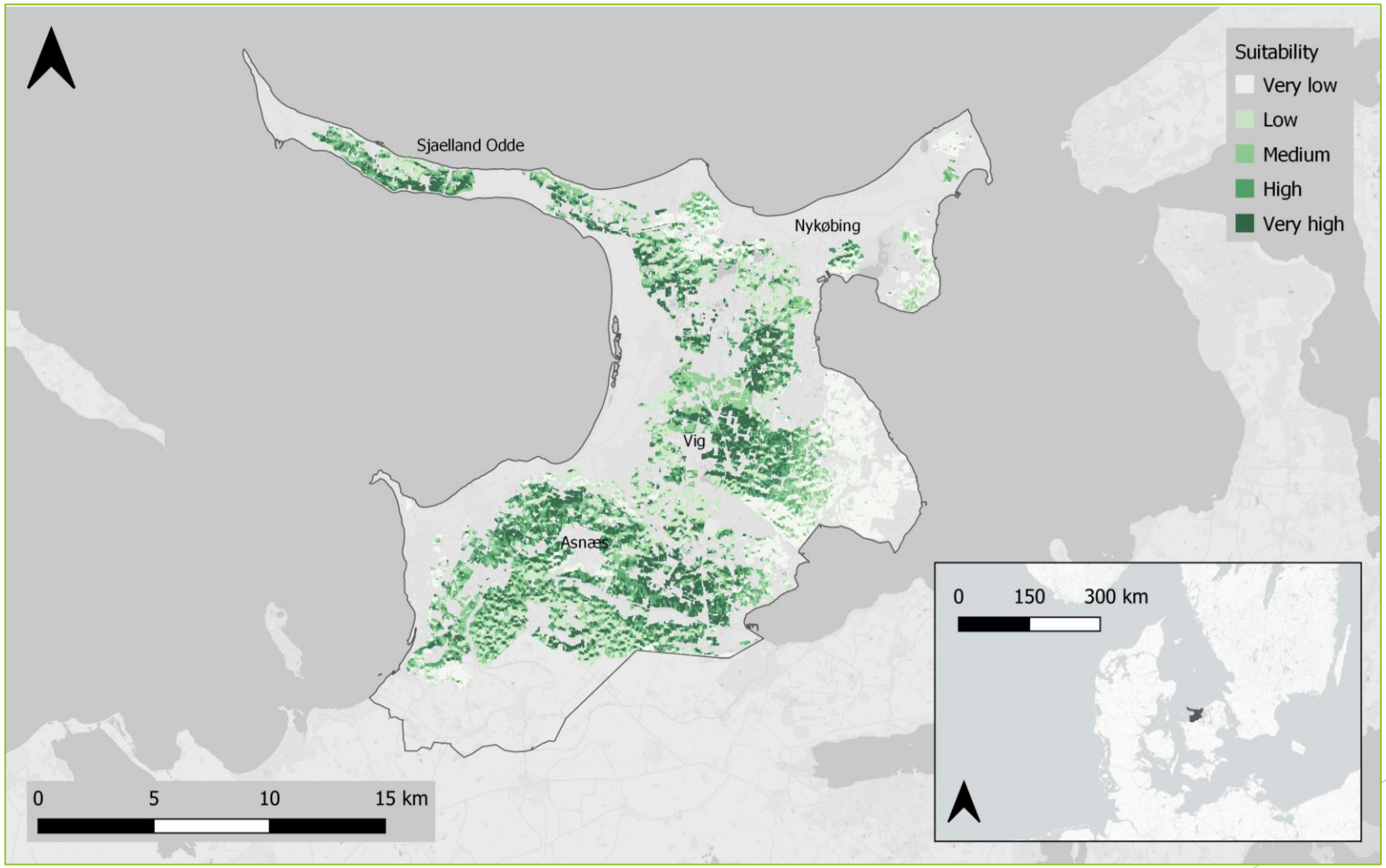
Depth-interviews

- Commune
- Land owners of solar farms
- Residential neighbours
- Academic professor

Results

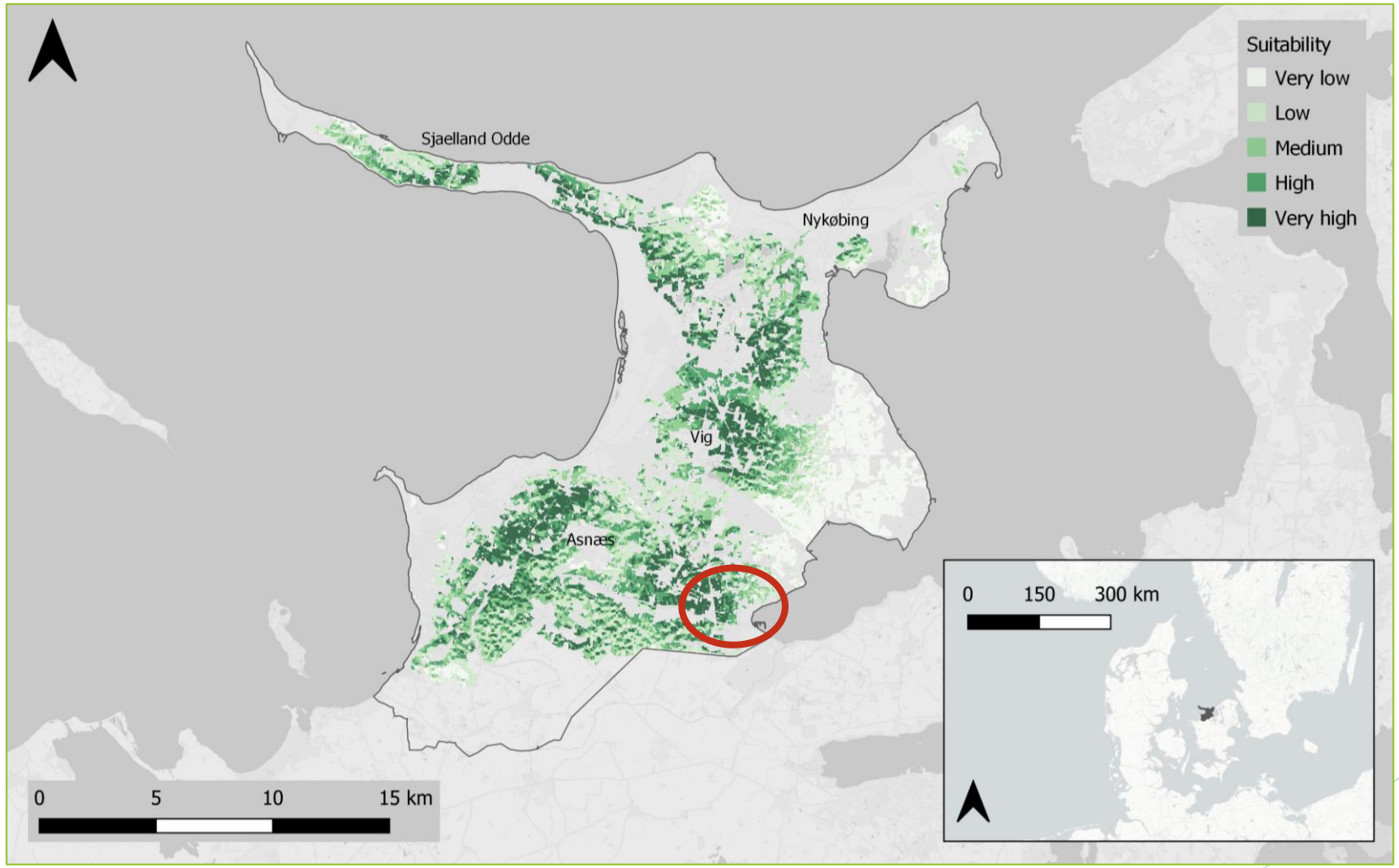
Suitability Map

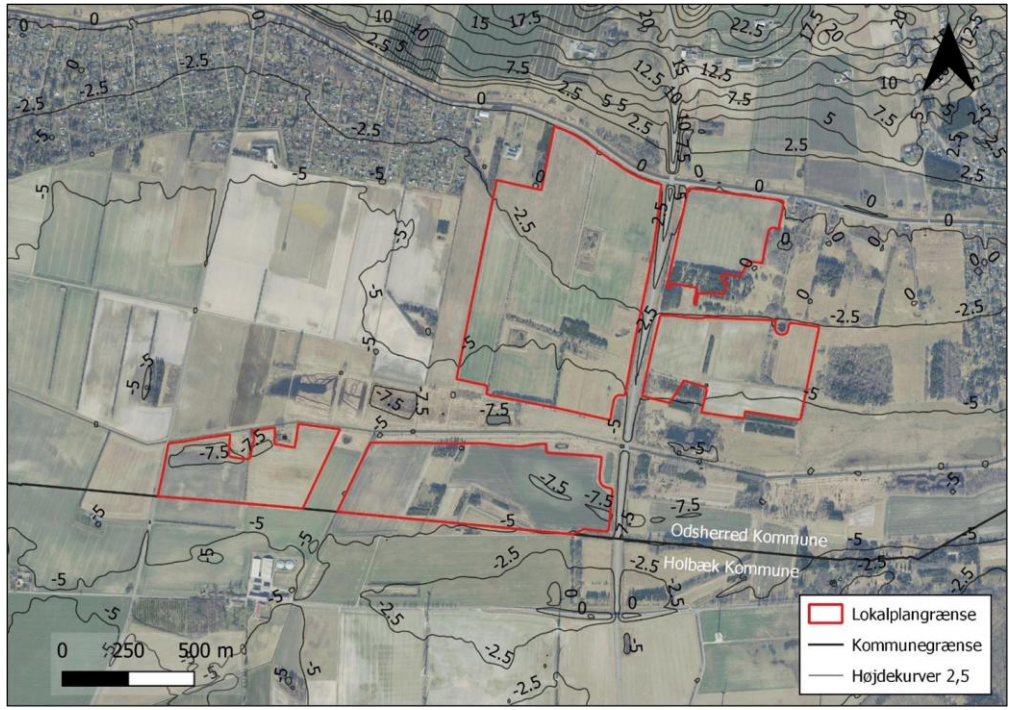
Equal weights



Suitability Map

Economical factors





Interviews - New project

- New photovoltaic solar plant in Grevinge Lammefjord:
  - Respond to the rising electricity demand
  - Serves approx. 39 000 households
  - Build in rural area with low population density
  - Implementing nature in it
  - Optimal imbedding in the surrounding landscape

Interviews – Opinion of Odsherred's residents

- Complaints:
  - Visual appearance
  - Noise
  - Decrease in land and house prices
- Positive responses:
  - Enthousiastic about green energy
  - Accepted when not visible
- Possible solutions:
  - Informing peolpe

NIMBY-phenomenon

Interviews - Multifunctionality

- Combining solar farms with other functionalities:
  - Sheep grazing
    - Time- and cost saving
    - Preserving biodiversity
    - Better animal welfare
  - Agriculture
    - Beneficial for crops and panels
  - Residential recreation → Possible solution for NIMBY-phenomenon
    - E.g., walk- and bike trails, playgrounds, resting places
  - Ecological growth
    - Passage corridors for animals
    - Flower seeding

Conclusion

- Physical and economic factors less relevant than public's opinion + land availability
- People's opinion negatively affected by visual appearance of panels + NIMBY phenomenon
- Numerous multifunctionality opportunities and can partly solve NIMBY-phenomenon
- High potential for solar energy in the future of Odsherred