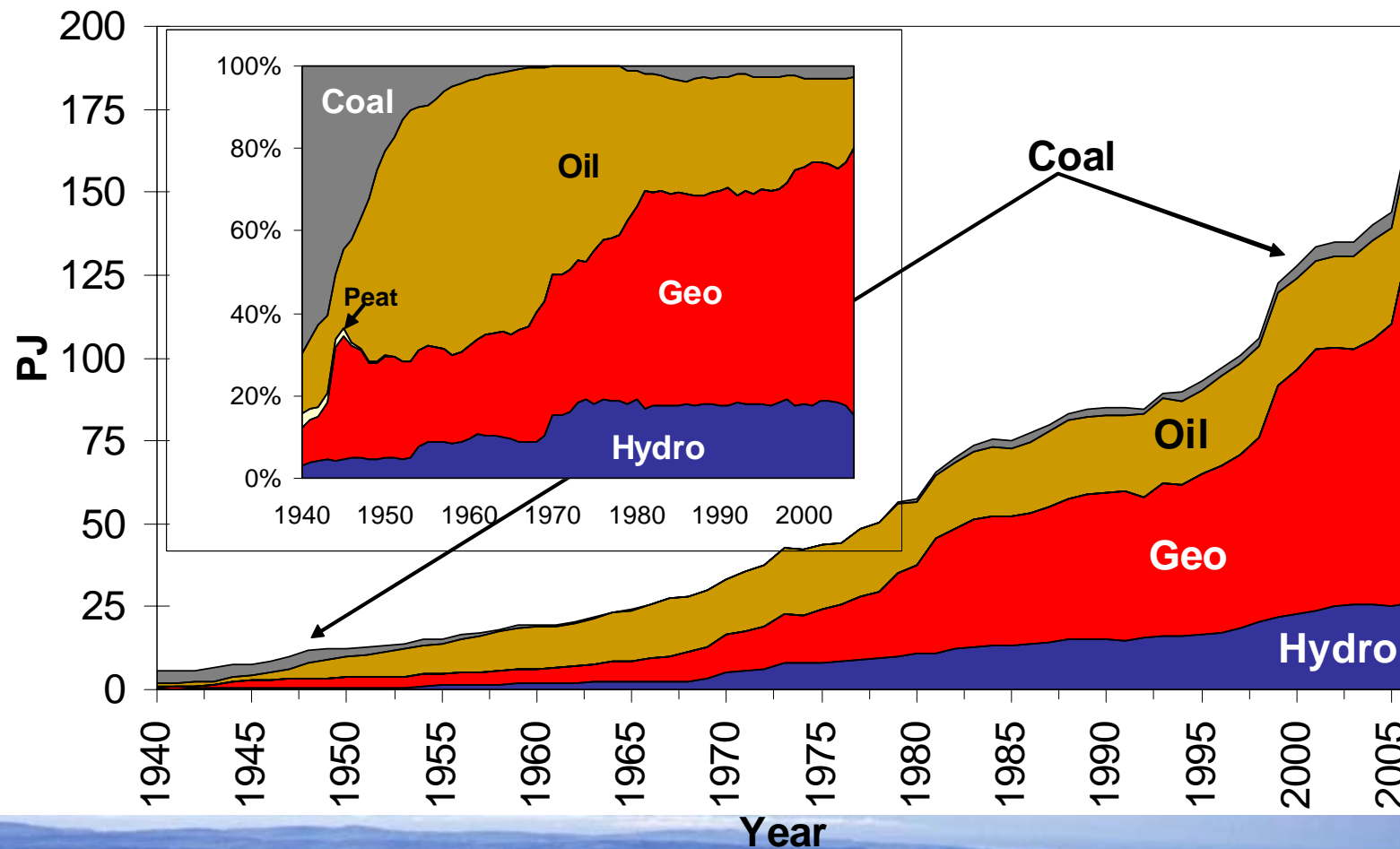


Introduction to Icelandic Energy Affairs – Status and Future Challenges  
Dr. Gudni A. Jóhannesson: Director General of the National Energy Authority



# Iceland - Primary Energy Use 1940-2006

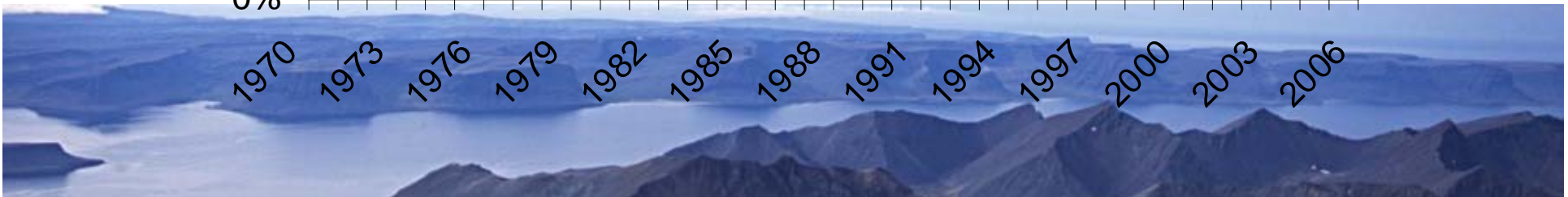
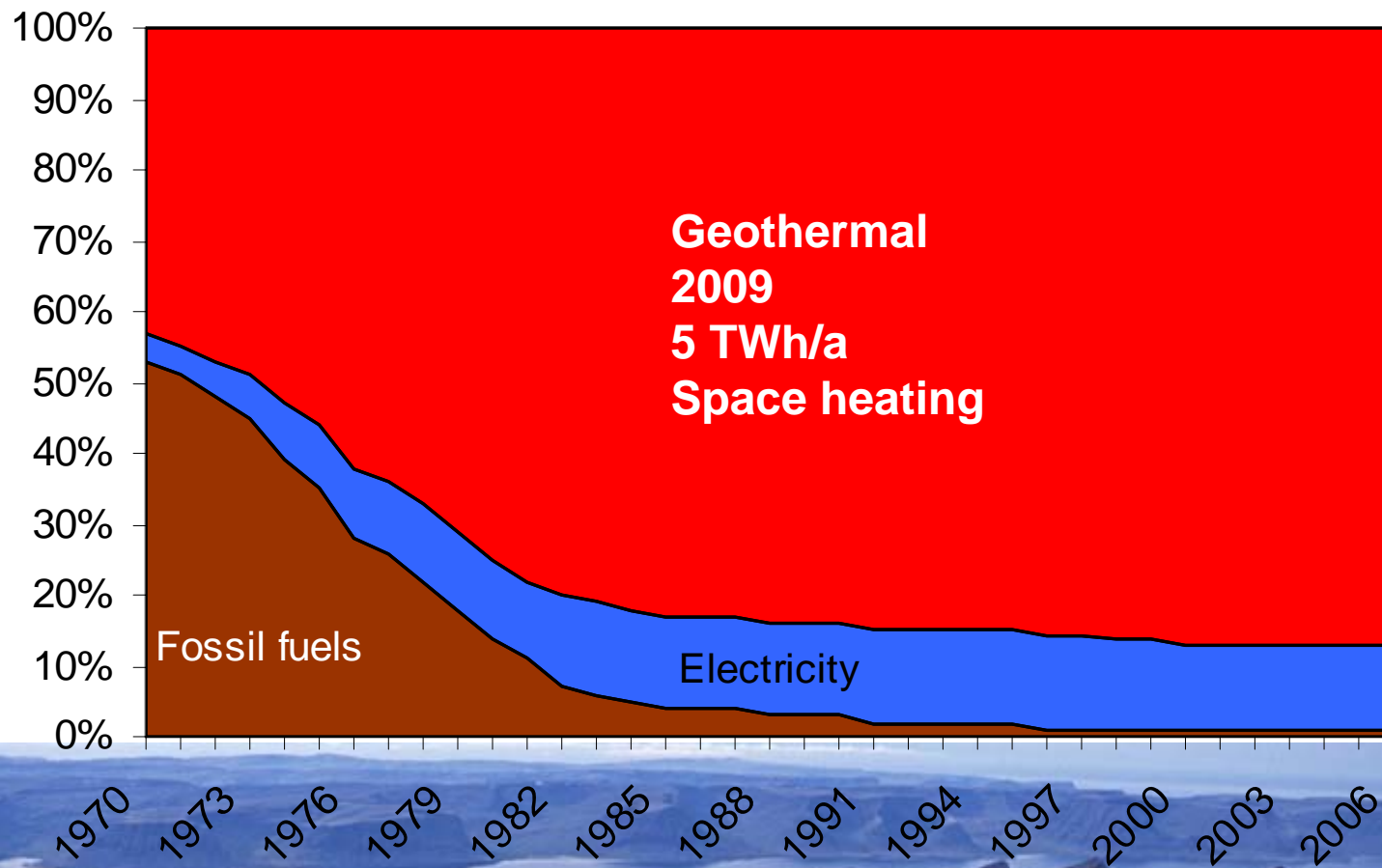


# Reykjavik - Geothermal District Heating Storage Tanks

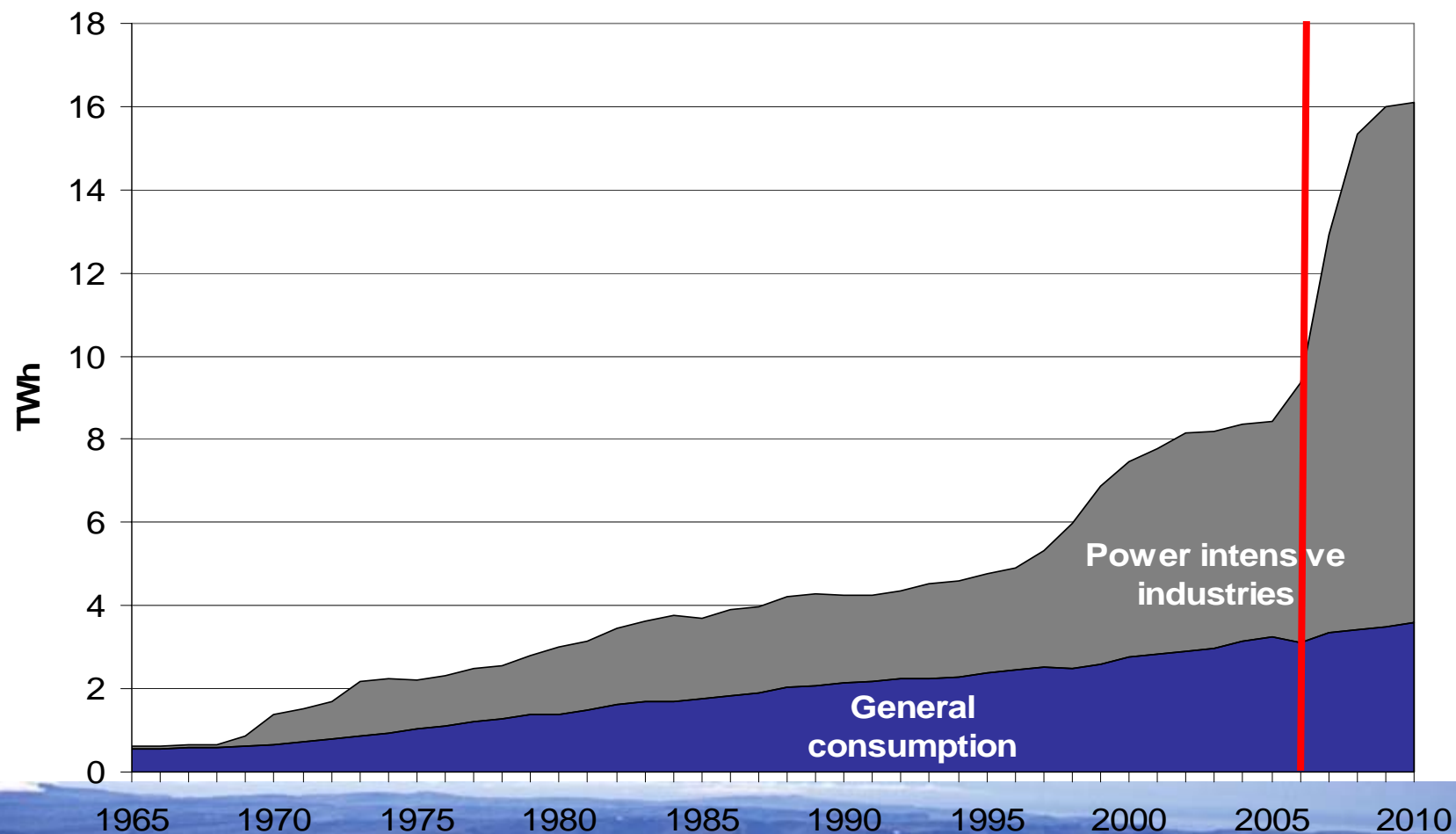


# Iceland

## Space Heating by Source 1970-2006



# Electricity Consumption 1965 - 2010



## Present Electricity Use

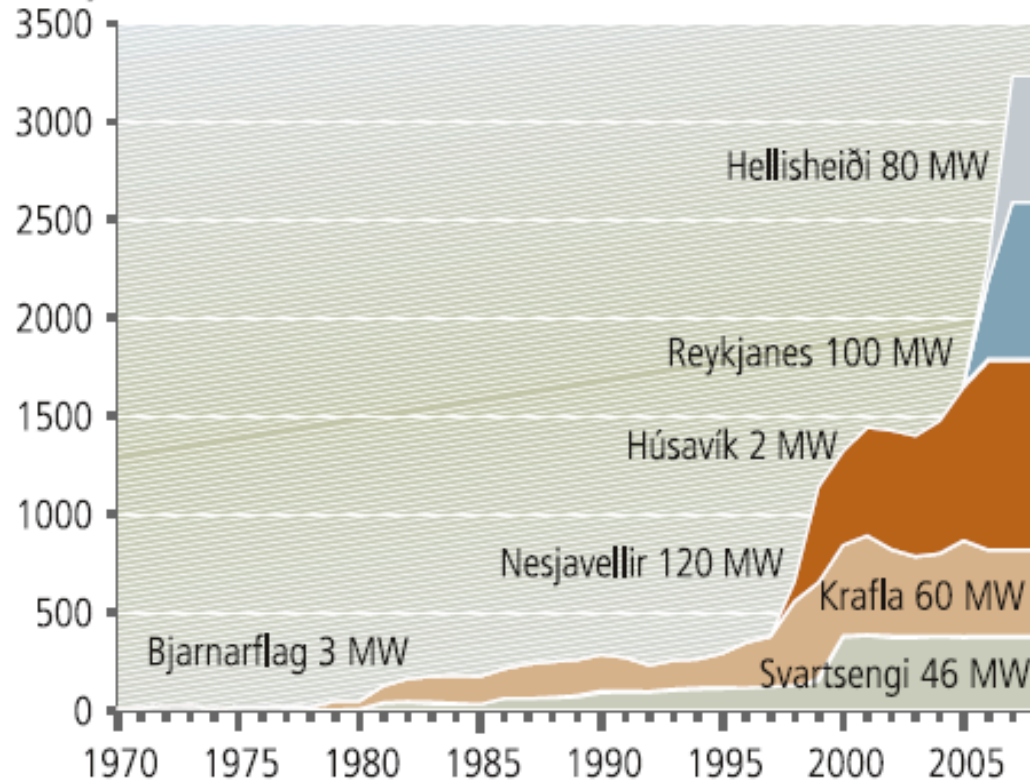
General use	3050 GWh	18.5%
Large industries	12430 GWh	75.5%
System loss	1000 GWh	6.0%



\*subject to the result of the Master plan program on feasibility and ranking of different power plant options

# Generation of electricity using geothermal energy 1970 - 2008

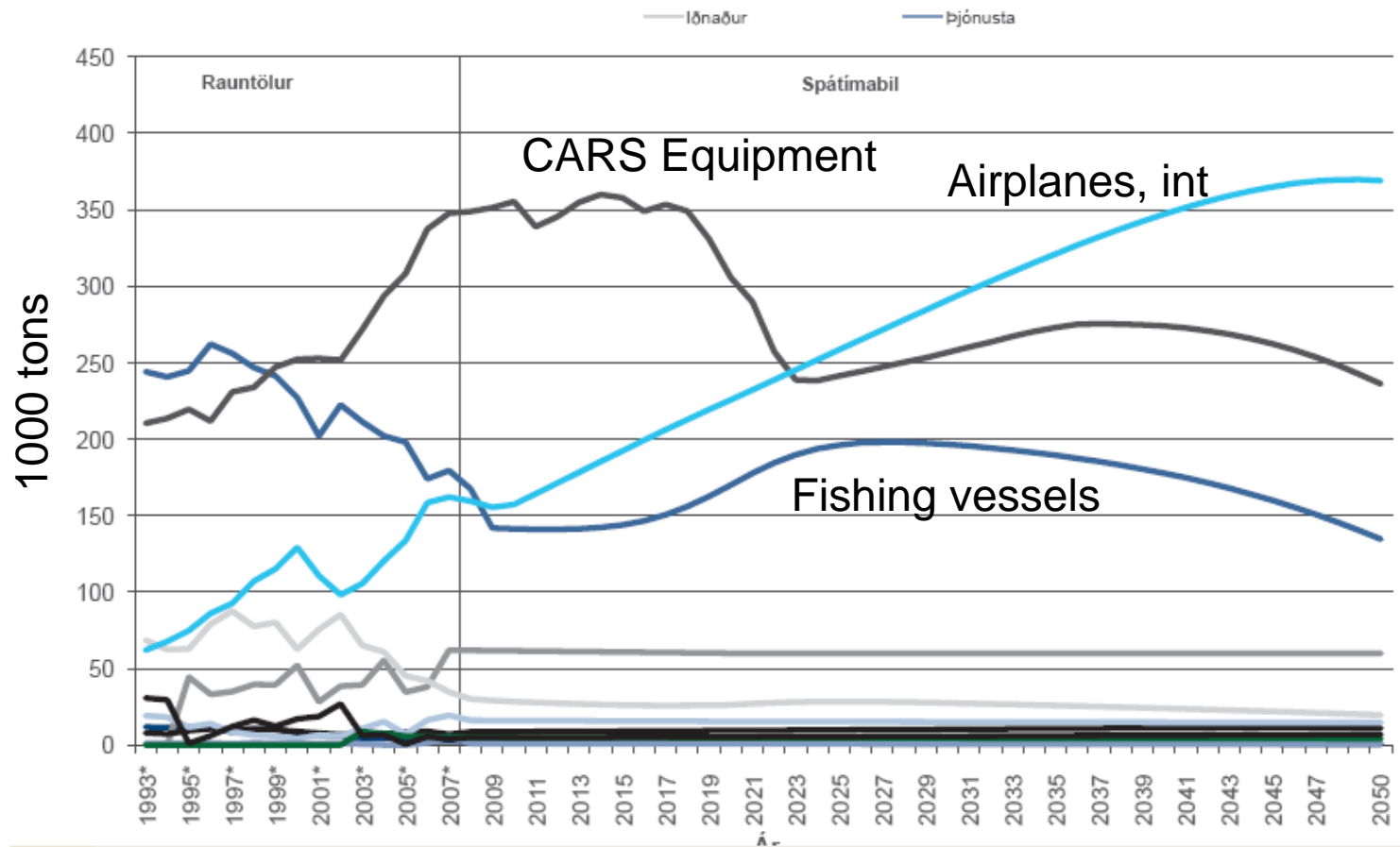
Electricity Generation (GWh/year)

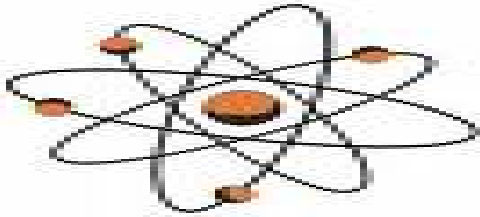


At present  
575 MW

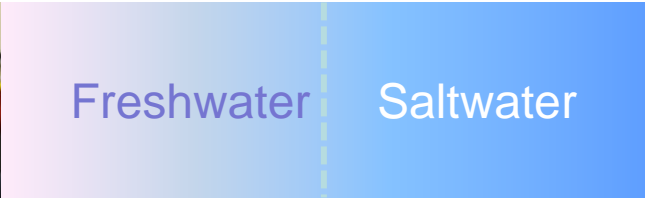


# Iceland - Forecast hydrocarbon use





# Alternative energy Cost per kWh ?



**2                      4                      8                      16                      32                      64 ISK/kWh**



# Future Energy Development in Iceland

Economical and social impact  
Nature and landscapes  
Financing and refinancing  
Manpower issues  
Energy market



# Strength

- Further hydropower options
- High temperature geothermal sources with water and permeable rock
- Favorable cooling conditions
- Scientific basis, skill, experience, know how
- Economically competitive
- Legal and regulatory framework
- Central management of research and data
- International co-operation and market possibilities



# Challenges

- Distance from larger electricity markets
- Impact on landscape and scenic values
- Small market with varying volume and discontinuities
- Project risk
- Sustainability
- Improved energy/exergy efficiency

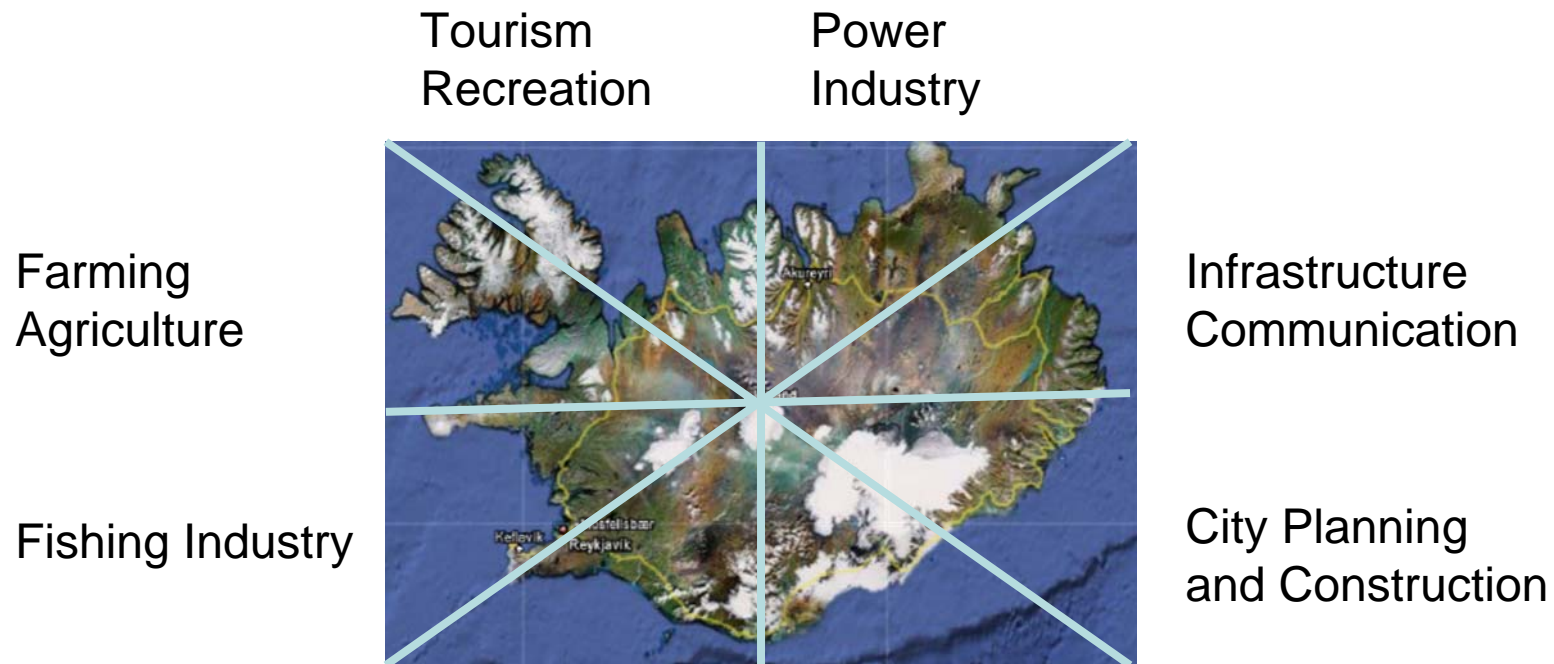


# Opportunities

- International market and cooperation
- Sustainability metrics and certificates
- New technologies for survey and exploration
- Deep drilling and high temperatures
- Low enthalpy generation
- Multiple revenue streams
- Carbon fixation in basalt rock
- Investment in energy intensive industries
- Electrical cars
- Synthetic fuels



# The Challenge: Conflicts of Interest in Sustainable Utilization of National Resources



Energy Intensive  
Industry

Nature  
Preservation





## The **Icelandic master plan** Evaluation and **ranking** of possible power plant options

- Impact of different power plant options *on* **landscapes**, geological formations, vegetation, fauna and historic sites.
- Impact on **tourism**, recreation, forestry, fishing and hunting
- Impact on alternative production options and long term impact on **economy, production and regional development**
- Power and energy capacity, **production cost** and overall economy.



**Thank you – Takk**