

# Will Icelandic households benefit from a sub-sea cable to Britain?

Dr. Ásgeir Jónsson

## Why connect?

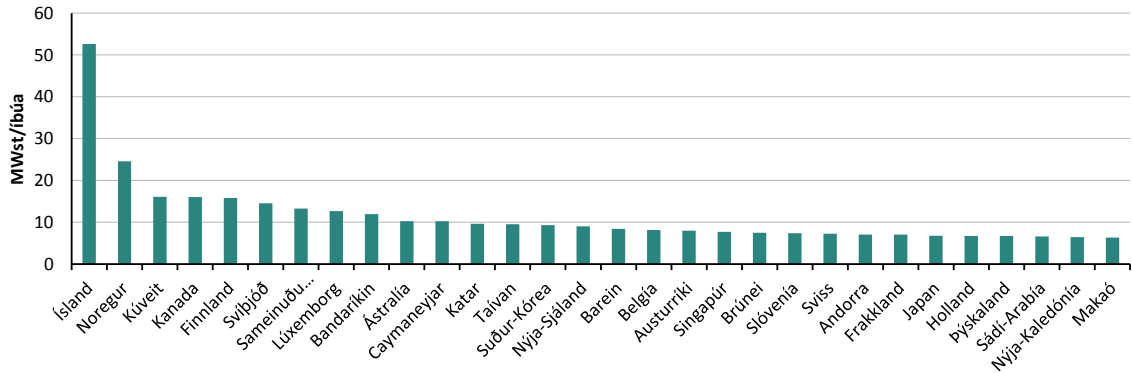
- The main argument for long-distance connections between different power systems is risk diversification, which is essentially the same argument as for asset diversification in portfolio theory; one can obtain higher returns with lower risk.
  
- **Long-distance connections open two possibilities:**
  1. The potential to smooth peak hour demand within a day, week, month or seasons and thereby decrease excess capacity as power can be alternated between areas, for example across time zones.
  2. The potential to utilize different production possibilities with uncorrelated operational risk, different cost structure and different response to reap both more efficient and more flexible production.
  
- Thus, a power-connection will lead to both more stable power prices and lower production cost from all parties involved.
  
- The number of long-distance inter-connections is rising over the world – Iceland would be the first country not to benefit from an inter-connection.

## Why connect to Britain?

- Iceland is the biggest per capita producer of electricity in the world and should export power either by selling power intensive goods or directly through a cable.
- Iceland constitutes an isolated power system in which a lot of excess power has to be maintained to ensure delivery to the aluminium smelters – an interconnector would free up to 2 TWh of power from the current plants.
- Iceland could also become the „battery of Europe“ like Norway where the hydro-power is kept in the dams for sale during high-peak hours in Europe.
- Iceland has a carbon free power that will bring an added value if could be transferred to Europe.
- Iceland might be able reap rents from its abundant natural resources power would it be able to connect to Europe.

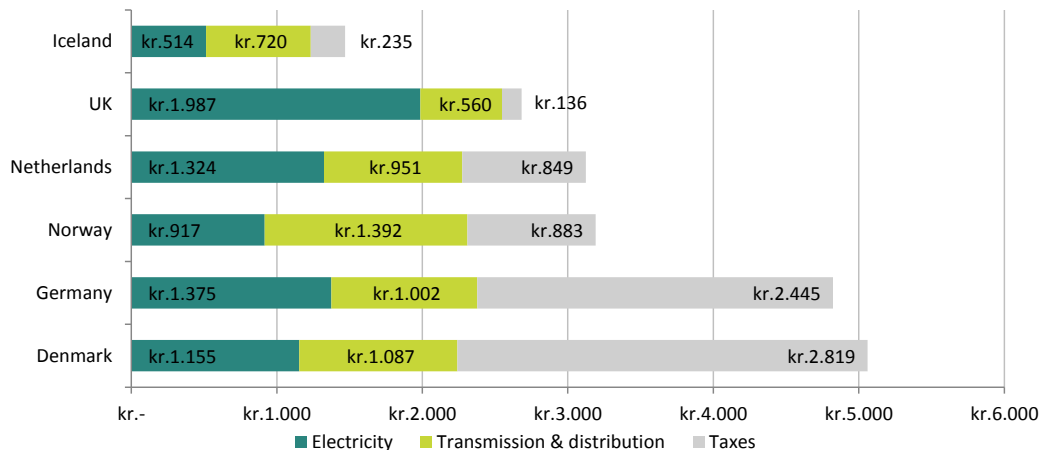
# Iceland is the biggest per capita producer of electric power in the world

Electric Power production per capita



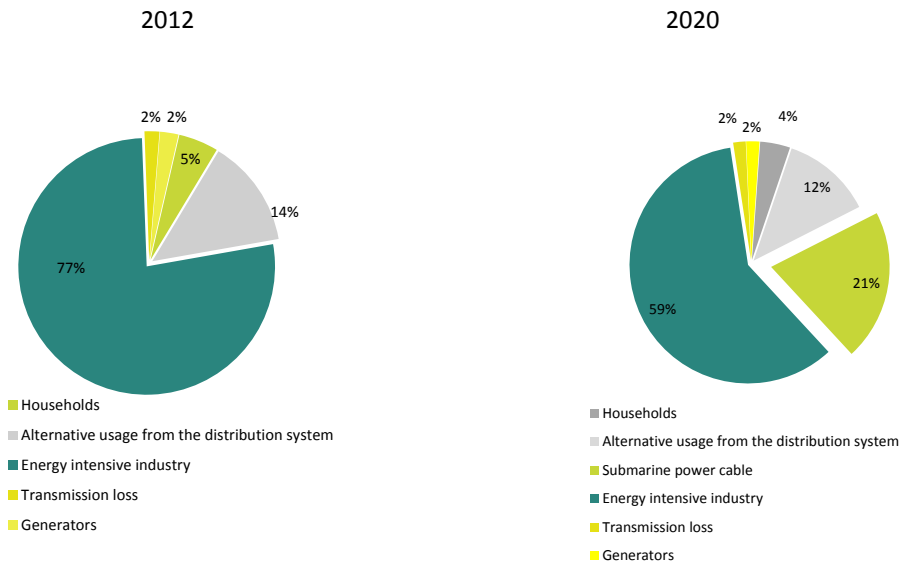
## Icelandic power prices are the lowest in Europe

The retail power prices, divided into components 100 kWst. for Iceland selected countries



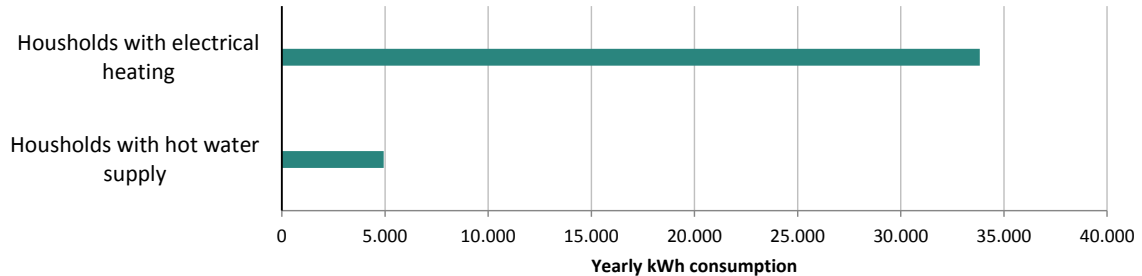
## Icelandic households only use about 5% of total power produced

The usage of electric power in 2012 compared with the usage in 2020 when a 5 TWst inter-connector is a part of the system



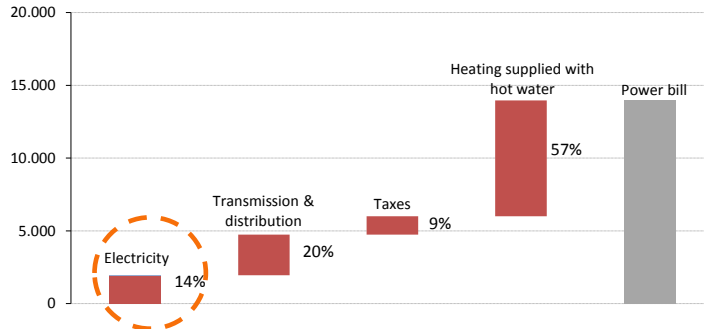
## 90% of households use thermal power for house-heating

The power usage of households with and without access to thermal heating

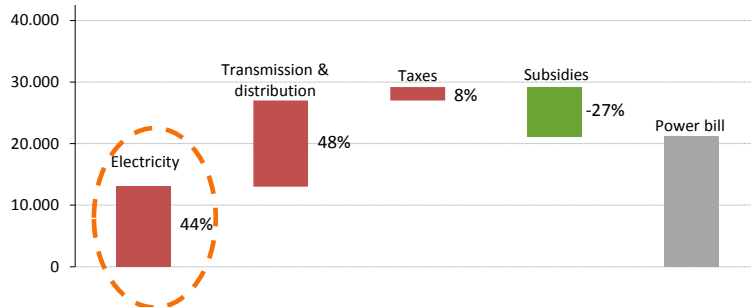


## Different location – different power bills

The power bill in a “hot” city in Iceland with acces to thermal heating



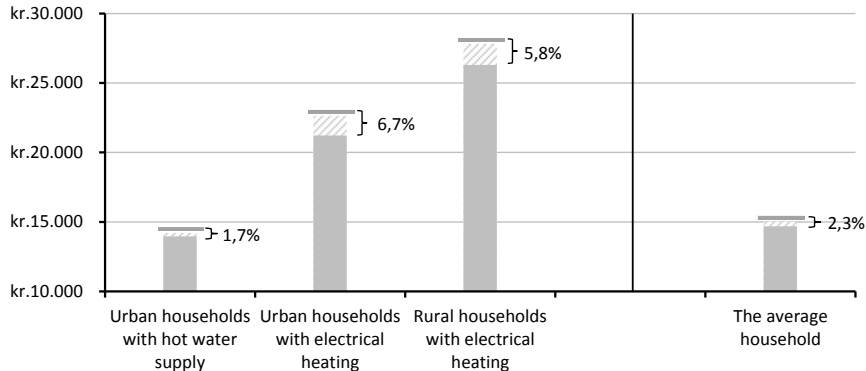
The power bill in a “cold” city in Iceland without acces to thermal heating





## Different locations – different effects from rising whole-sale prices

The effect of a 10% increase in whole sale price of electricity



*90% of homes 4% of homes 3% of homes = 97% of homes in Iceland*

# Four ways estimate the social benefits of a sub-sea cable for

## Icelandic households

- 1. Plain microeconomics** – an interconnector will lower average production cost of electric power in Iceland as excess capacity is eliminated.
  - Increased efficiency – a free lunch!
- 2. International trade** – Iceland is power-rich country that should power either through good exports or direct power transfers – thus a higher power price will benefit the country in a similar way as a higher fish-price.
  - The government can easily find ways to compensate the households for a higher power bill.
- 3. Jobs and value added** – If the sale of electricity through an inter-connector will deliver profit for the state owned power companies, the profit can easily be directed into the economy through public investments or tax cuts that will deliver numerous jobs in targeted sectors.
  - The three aluminium smelter use about about 75% of Iceland's power production but only 1% of the labor force.
- 4. Financial efficiency** – power sales through an inter-connector will lead to both higher price and lower risk since the power would be sold to a many different new clients.
  - There is a high risk involved selling 75% of the power production to not only one sector, but to only three companies within that sector, and addition to this to link power price with the world price oa aluminium.

## Conclusion

- One can look at the current low retail price of power as a one form of public policy – however that policy is very inefficient if it contingent on keeping general power prices low.
- Icelandic households only use about 5% of the total power production and there are various to subsidies retail power price, if that is main thing on the political agenda, that are much more efficient that the current policy.
- If one assumes that an inter-connector is technologically feasible and financial risk concerning both the financing and operation of such project would be outside Iceland, it is very likely, and almost certain, that it would bring economic benefit to Iceland like all other countries that have connected themselves to their neighbor's power system.