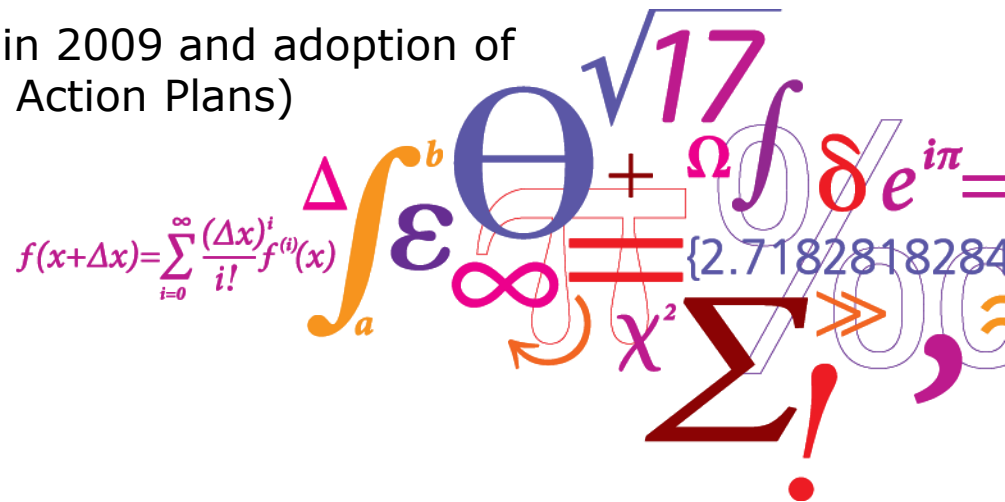


Data considered by energy models and resulting scenarios and policies

Review of the source of data:

- Highlighted in energy scenario papers
- Targeted by energy policies

Since Renewable Energy agreement in 2009 and adoption of NREAPs (National Renewable Energy Action Plans)



Introduction

Wind2050 project



Cross-disciplinary study of causes and consequences of public concerns towards wind energy - Recommendation of mitigating measures

Main focus: Denmark, but partners in UK and Ireland

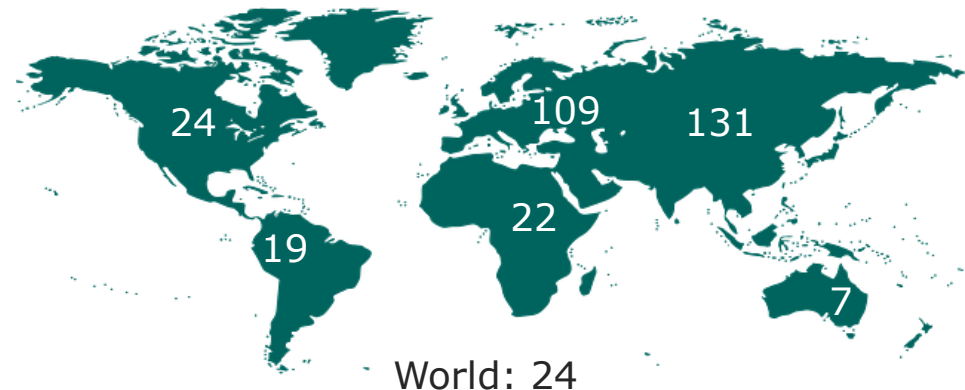
- Partners:
- Technical University of Denmark, Management Engineering
- Technical University of Denmark, Wind Energy
- Copenhagen University
- KORA
- Aalborg University
- Concito
- Danish Wind Industry Association
- Queens University Belfast
- RPS Group Ireland
- University College London

Method

Systematic Review of Energy Scenario Papers

- Purpose: Documenting the energy scenario effort worldwide
- Media: peer-reviewed scenario papers for global energy systems
- Recording:
 - Area covered: Group of countries, country, region
 - Period covered
 - Type of model used or combination of models
 - Other approach
 - Mention or inclusion of socio-institutional dynamics

- Counts after latest update:



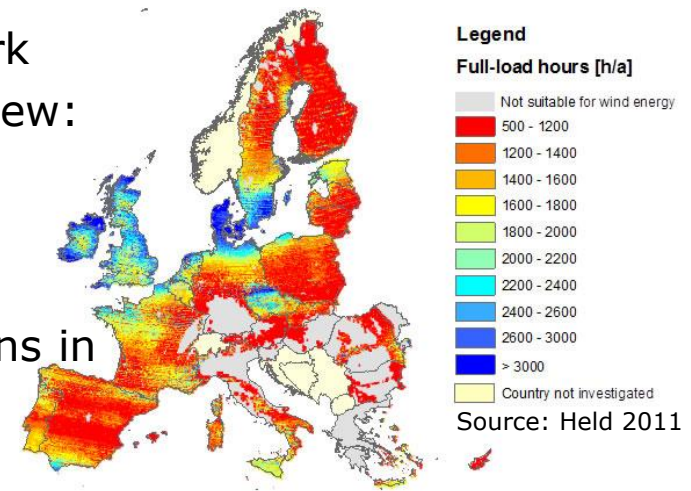
Method and content

- Method: systematic review of energy scenario papers

1. Focus of this study: UK, Ireland and Denmark
2. Extract relevant papers from systematic review: 13 documents

3. Coding of:
 - Methodology and resulting scenario sections in scientific papers
 - Policy section in NREAP documents

4. Results: 83 codes grouped in 12 families
5. Study of model run based energy scenario report, and the data highlighted and analysed by authors



Analysis method

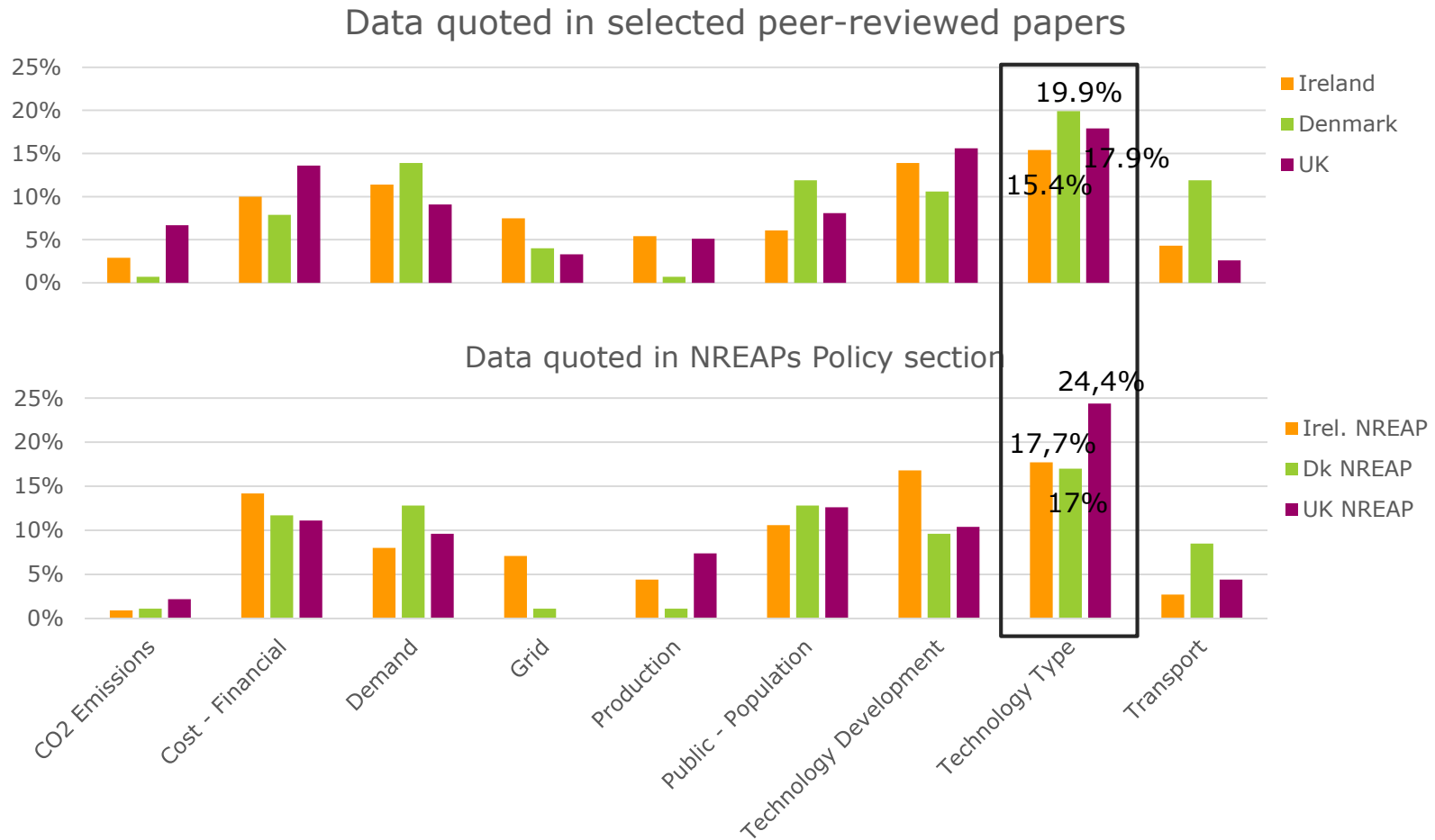
- Visualisation → Representation of dominant data according to peer-reviewed scenario papers and NREAP policy sections since 2009
- Overview of “qualitative” problematics linked to renewable energy sources
- Using semantic study, how are these problematics mentioned in the publications studied here?
- Overview of existing projects looking at those dynamics



Visualisation

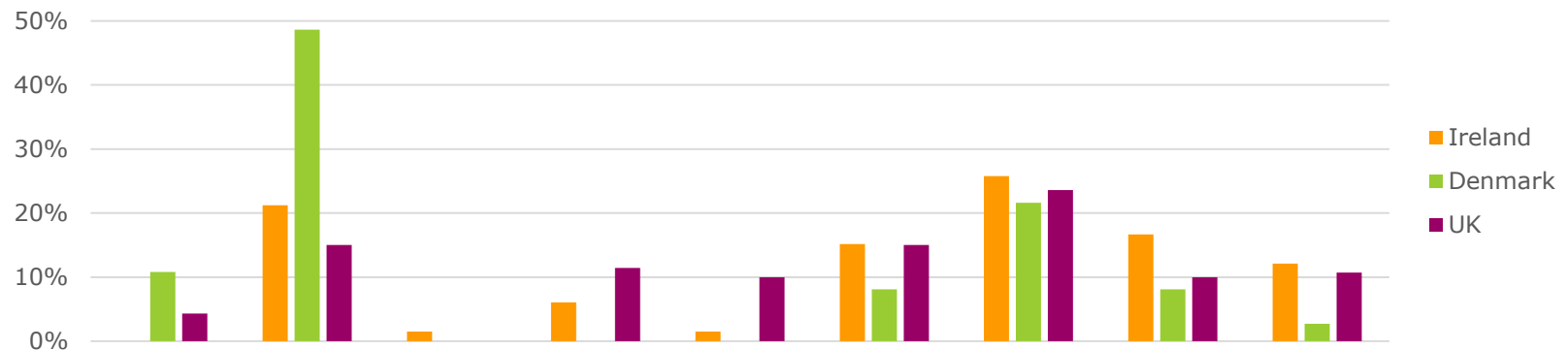
Graphic representation of 12 families representing 83 codes:
% of appearance of each family among total of quotes

Type of data considered or highlighted Energy sources

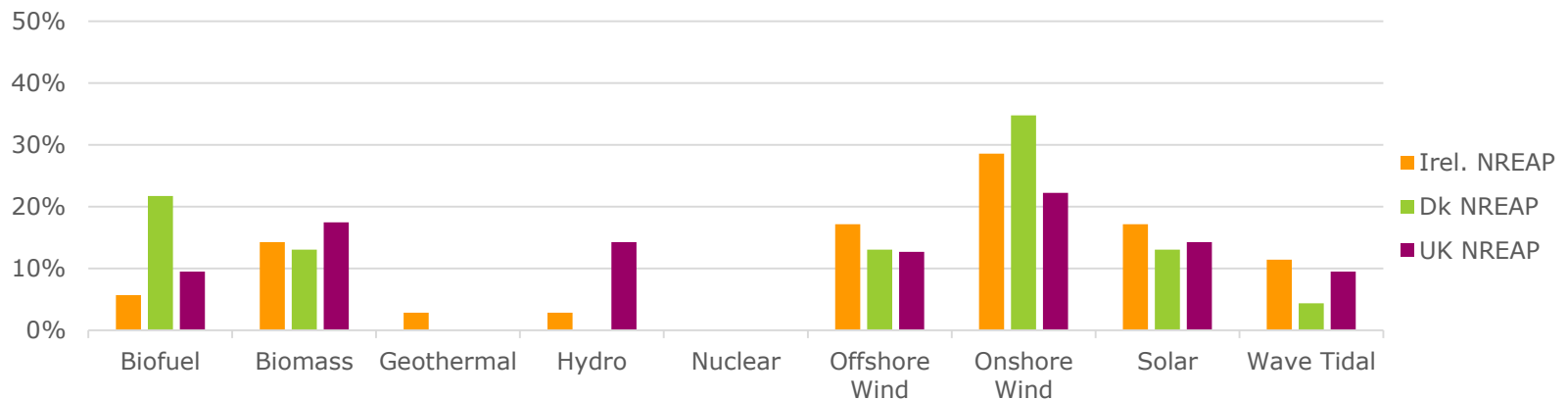


Mentions of RE sources per Country

RE types quoted in selected peer-reviewed papers



RE types quoted in NREAPs Policy section



Overview of Qualitative dynamics
linked to Renewable Energy sources

Common qualitative issues linked to REs

- Wave and tidal: industry not progressing as planned despite high potential
- Solar: important cut-backs in Feed in Tarriff
lack of trust in consultancies
- Security of electricity supply is a national issue, however private developers are still in charge of projects
- Studies have shown that Green Scheme type payments are often seen as bribery by neighbours who are not directly benefiting
- No clear national communication campaigns in favour of RE towards general public

Zoom on onshore and offshore wind



- In 2009 NREAPs and following papers, onshore wind still foreseen as main source of RE for next 20 years
- However it is one of the technologies that raise main concerns, due to:
 - High exposure compared to other infrastructures
 - Relative high visibility
 - Worries about impact from noise not yet lifted
 - New questions regarding low frequency noises
 - High profile of government subsidies
 - Myths still existing (they are broken when not rotating, they are made to rotate to give illusion they work)
 - Market governed by private large developers
 - Many consultancies appeared with boom from FiT, not always with required expertise → lack of trust from public
 - Often seen as bribery by neighbours who are not included in payments

The impact of socio-institutional dynamics on RE development: Case of Denmark

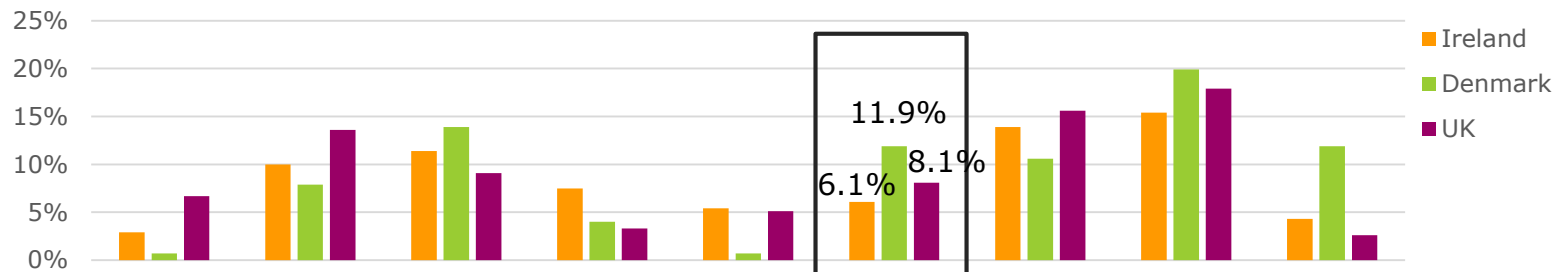
Only country with RE incentives →

Compensation of loss of property value
Option to buy project shares for neighbours

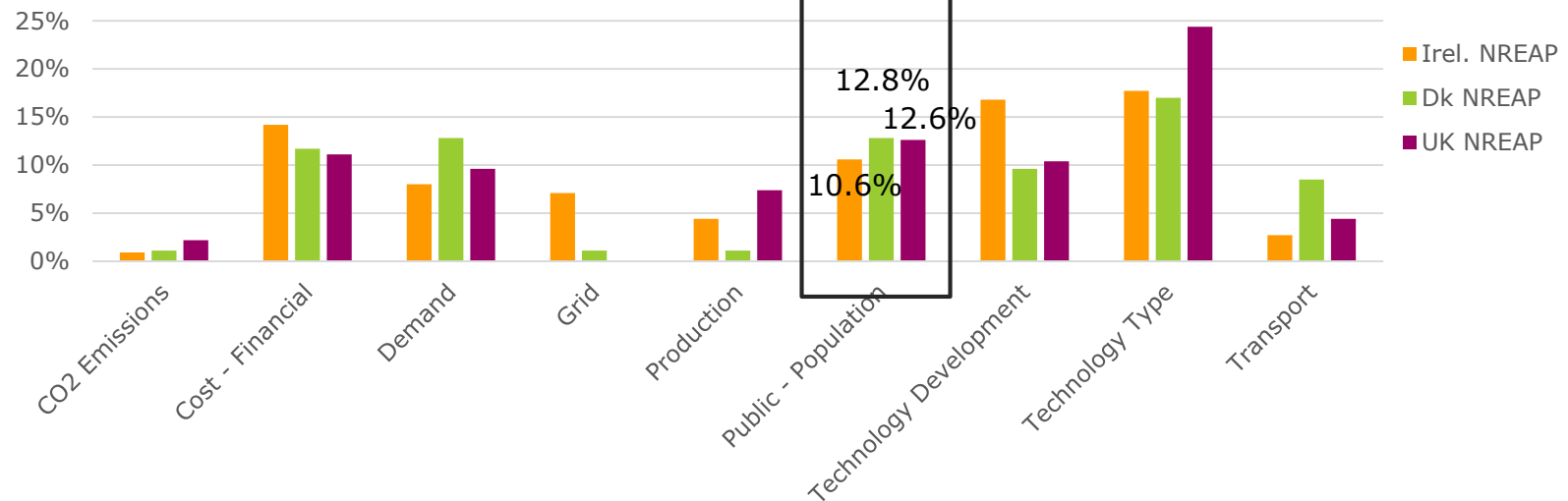
- Actual costs of Renewable Energy Incentives
- How many projects do not go through?
- Increasing duration of wind energy project development: in the process of collecting data in collaboration with grid operator Energinet
- What is the indirect costs of longer projects?
- How many good locations are not considered due to likely issues
- Large wind developers are buying out whole houses or group of houses in Denmark
- Many projects on hold waiting for results of health study
- **Studies so far in Wind2050 link public concerns to a lack of empowerment felt by the population, compared to the project developers**

Type of data considered or highlighted Population

Data quoted in selected peer-reviewed papers

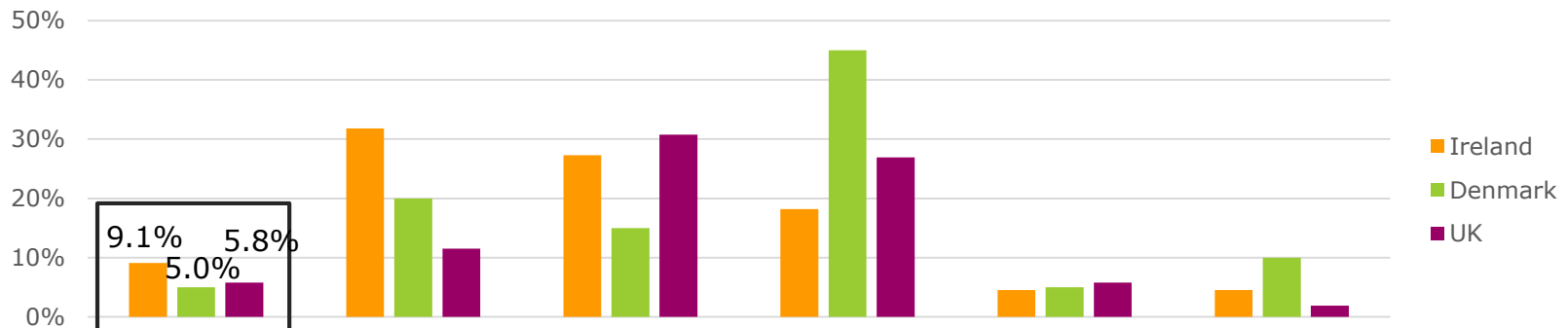


Data quoted in NREAPs Policy section

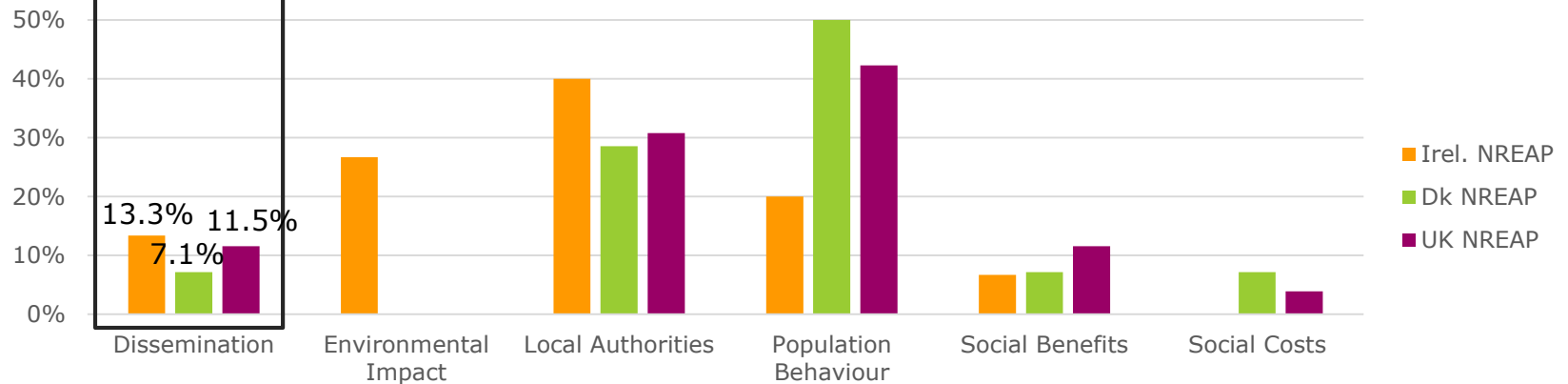


Population-related data Dissemination - Information

Population data quoted in selected peer-reviewed papers



Population data quoted in NREAPs Policy section



Contexts of quotes regarding population and dissemination

- In 2009

Ireland

This is an information service on renewable energy that provides the public with a service whereby they can easily obtain practical information on renewable energy

Denmark

To gain experience and knowledge on the use of electric vehicles and their interrelation to the electricity system

UK

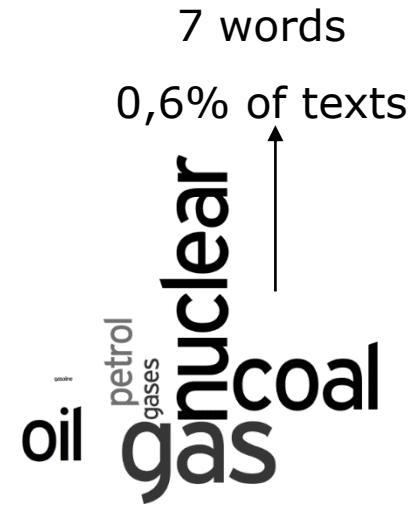
Motivating the public to act on climate change through take up of renewable energy

- How are these policies evolving in a context of budget cuts?

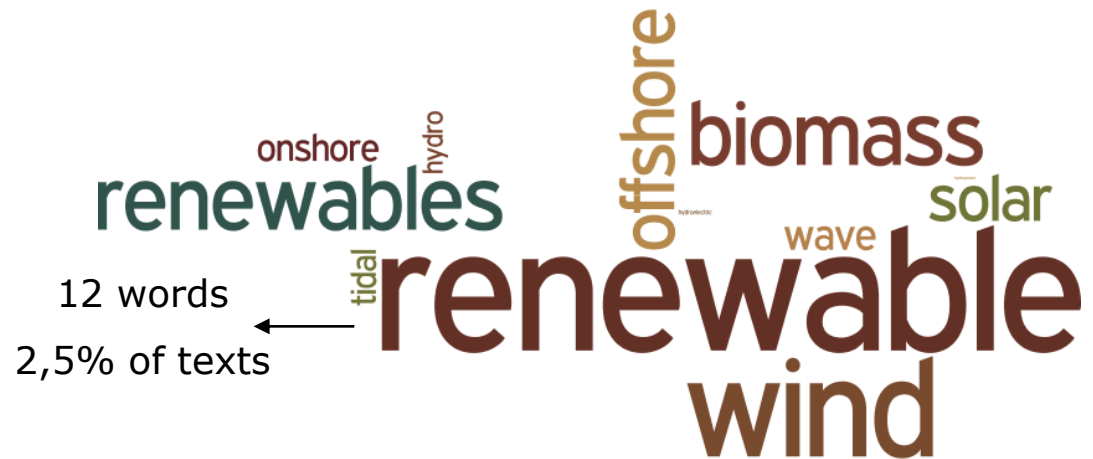
Word counts



80 words
1,3% of texts



7 words
0,6% of texts



12 words
2,5% of texts

Following steps

Efforts to bridge gap between quantitative and qualitative - Projects

- This PhD project is about documenting the efforts that are made to bridge the gap and how they are planning to do so.
- DTU and partners - COMETS project
COMETS contributes to a cost-effective fossil free energy and transport sector by 2050, by understanding the impact on the energy system from 1) the transport sector, 2) consumer preferences and behavior regarding transportation, and 3) planning of cities and transport infrastructure.
- University College Cork - Understanding Community Behaviour on Climate Mitigation and Blueprint for Action
- Other projects???

Next step

- Next step: Describe the models, scenario planning process and incentives behind. How is the energy planning in each country? How are models used?
- How are social concerns considered among modellers and scenario planners?
- Next step: What can be done to foresee discontinuities?
- Test the findings
- Example of a major discontinuity?



Example of major discontinuity: British Government

- Decision to stop Renewable Obligations one year in advance without warning. 2016 instead of 2017
- Clear dislike of onshore wind technology by many members of government
- Refusal of well established projects in officially selected areas in the UK, especially in Wales' TAN zones
- Unexpected refusal of large offshore wind projects
- Wave and tidal devices companies filing into bankruptcy
- Whole solar industry in serious difficulty
- British government decision to accelerate development of fracking industry
- Dong UK addressing British parliament's energy and climate change select committee

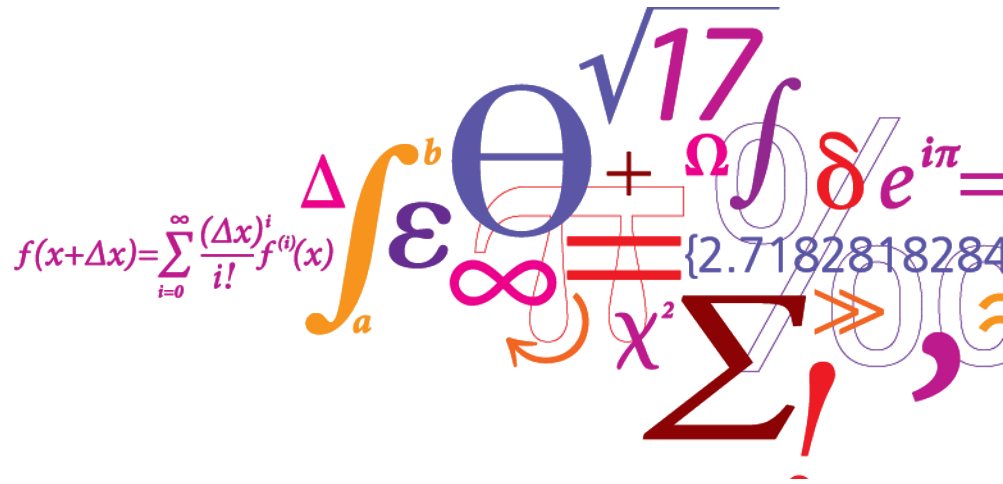
Thank you



renewable planning uk electricity scheme development national ireland northern scotland support england local wales carbon applications use regulations information policy technologies government biomass renewables gas obligation transport system generation heat supply scottish fuel network change infrastructure measures provide grid sources connection transmission authority licence available schemes consent buildings building environment required plan climate ofgem projects currently land

renewable electricity generation wind heating consumption local biomass heat installations danish support expected scheme turbines district biogas sources transport authorities denmark supply areas national directive planning network article requirements new solar biofuels re connection agency buildings waste cooling development gas plan information wood system projects area estimated agreement land final what efficiency measures dk power order rules existing sector green authority initiatives climate current plants accordance natural installation executive share pj gross state transmission schemes action

Actual word clouds of NREAP documents



renewable electricity development ireland planning scheme national information wind system local biomass directive cer generation sea grid regulation network market transmission support process department government projects existing target section public infrastructure authority sources technologies offshore irish eirgrid generators gas connection resources new distribution chp refit level policy commission available heating res regional specific capacity technology heat requirements article sustainable project sector strategic area fuel programme plan certain schemes building

DTU Management Engineering
Department of Management Engineering

cebou@dtu.dk