START HERE

WHAT WE DO?

Automatic summarization and analysis of 10-years national energy and climate plans (NECPs) of the EU Member States.

WHY?

In the fight against climate change, we need systemic changes. Taking action by political entities generates tons of documents.

FOR WHOM?

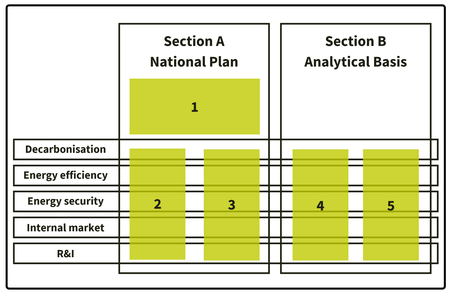
For people who want better citizen governance & engagement over climate policies and public policy research.

CLIMATE POLICY TRACKER

Pipeline for automated analysis of public climate policies

DATA

- The Climate Policy Tracker is the solution for analyzing the 10-year **National Energy and Climate Plans** (NECPs) for the period from 2021 to 2030 established by 27 Member States of the **European Union**.
- These documents contain information on how individual countries want to relate to the EU's critical energy and climate policy dimensions.
- To ensure the parallelism of the plans between the Member States, NECPs had to follow **a unified structure** facilitating comparison and aggregation. According to the template, five Energy Union dimensions and five sections can be distinguished.



OUR PIPELINE

National policies with the **same structure**

NLP component for **topic modelling based on LDA**

Analysis of policies **within and between the countries**

Conclusions for **citizens**, **policy makers** and **scientists**

POLICY MAKERS | **COMPUTER APP FOR ANALYSIS** | **CITIZENS**

- For modeling topics, we use **the Latent Dirichlet Allocation** (LDA) model as it assumes each document is a finite mixture over an underlying set of topics.
- We assess the quality of topic modeling for hyperparameter optimization using two **coherence measures**, CV and UMass. Moreover, we manually analyze and validate the results.
- We use **saliency** and **relevance** metrics for analysis of resulted topics and their description.
- We use **similarity measures** computed in terms of similarity of distributions for analyzing obtained topic distributions (agendas). Specifically, we select an **information radius** measure (Jensen-Shannon divergence).

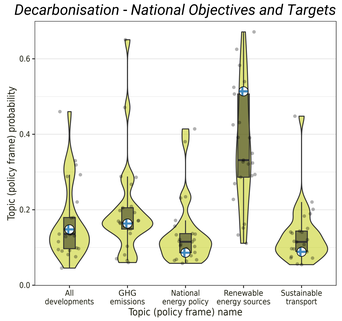
CONCLUSIONS

- **Climate change** is one of the most critical global threats. Creating **public policies** regarding this matter is essential in counteracting this problem. However, the creation of the policy itself is insufficient without the actions undertaken by the citizens and policymakers as a result.
- Our system allows for **quick analysis** of the focus of each national plan, **comparing** multiple countries across different dimensions, and detecting alignment between countries in policy framing. This could benefit the **public understanding** of the landscape of climate plans in the EU. It can also help to identify countries with similar problems in specific areas and provide opportunity to **create common solutions and plans for future development**.
- Our method and pipeline can also be used to analyze other kinds of **similarly structured** policy documents, not only related to climate change. One of the documents that can be run through our framework in the future is a **progress report** produced by each EU Member State every two years regarding the changes they introduce as a result of their NECP.
- This work can be seen as a first step in developing methods for **automated analysis of climate policies**. In the future, such methods could allow **tracking** of how those policies change over time and how they relate to changes in the economic factors of countries.

JUXTAPOSITION OF POLICY FRAMES

FINLAND'S POLICY FRAMES DISTRIBUTION COMPARED TO OTHER COUNTRIES

Decarbonisation - National Objectives and Targets

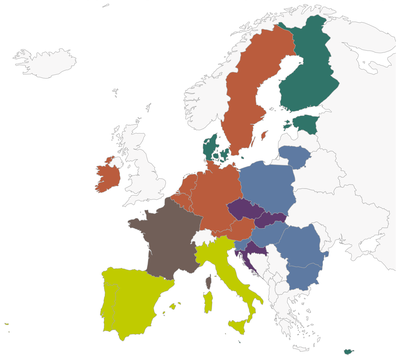


- The result of topic modeling are the topics and their distributions in each analyzed text. Topics are considered **policy frames**.
- Topics were **automatically named** using the most characteristic tokens (keywords) with GPT-3.
- It is possible to **examine the distribution of topics** for the selected country and compare them with the overall results for other countries.
- By analyzing the topics' distribution, we conclude which country focuses on which policy frame in each of the dimensions.

CLUSTERING BASED ON AGENDAS

- Based on the agendas (topic distributions), specific **groups of countries** with a similar approach to the particular subject can be differentiated.
- Our pipeline allows for **clustering** countries with similar agendas. Hierarchical clustering, HDBSCAN, and K-means algorithm are used for this purpose.
- Some clusters reflect **geopolitical relationships**. Countries with comparable economic and political situations are grouped together as they frame issues similarly. **Outliers** can also be easily detected this way.

CLUSTERING FOR *DECARBONISATION* DIMENSION

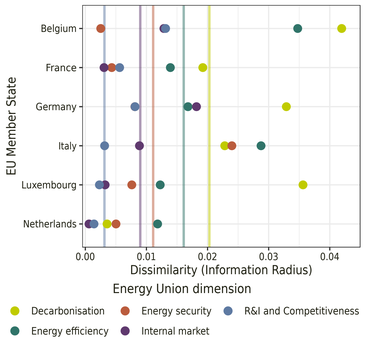


colors represent clusters

DISPARITIES IN DOCUMENTS

- Topic distribution can be used for more sophisticated analyses, e.g., to **detect inconsistencies** in the agendas.
- It turns out that there are **notable disparities** between the sections describing objectives and policies intended for achieving them.
- Some countries have more discrepancies than others and this phenomenon is more typical for particular dimensions.
- It allows for **distinguishing countries** that do not take initiative to achieve the established objectives.

DISPARITIES FOR FOUNDING MEMBERS OF EU



MI RESEARCH

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TACKLING CLIMATE CHANGE WITH MACHINE LEARNING
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