Lobbying beyond Interests in the EU Climate Change and Energy Policy-Making Process: 
An Explanation of Coalitions’ Formation using Multilevel Network Dynamics

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Abstract
EU institutions take into high consideration inputs from interest groups and lobbies. These organisations provide institutions with technical expertise that policy-makers of the European Commission, Parliament and Council usually lack. Prior to any policy proposal, the European Commission consults with interest groups to get insights and updated information on the policy issue. Thus, interest groups, private companies and members of the civil society develop formal and informal networks and submit position paper, both individually and collectively. Coalitions can be different in nature: cross-sectoral, isolated at the periphery of the network, or well-connected. However, within the same consultation, some actors may formally join more than one coalition and present different position papers including contrasting policy preferences. Why do coalitions within a policy network take these particular configurations? Why do certain actors decide to join more than one coalition and submit different position papers?

This research will focus on the consultation on Energy and Climate Change, opened by the European Commission in 2012 and the dynamics between the actors that participated. This research argues that to understand why coalitions overlap and why actors submit contrasting position papers, it is necessary to look at those dynamics that brought actors together under the same coalition. By representing the policy network of a sample of selected actors, this research will unveil lobbying strategies and how these affect the structures of coalitions. This research will contribute in two ways. First, from a methodological perspective, it will combine network analysis with automated text analysis. Second, from a theoretical perspective, the research will highlight how interest groups’ coalitions are not black or white, but more nuanced and depending on policy preferences and informal working relationships.
The EU policy making process and the role of consultations:

In the EU policy-making process, the European Commission has an important role in drafting policy proposals and initiating new debates on specific policy issues. The policy proposal drafted by the European Commission is afterwards submitted to the Parliament and the Council for further amendments.

The Commission lacks knowledge on highly technical policy matters. However, by regularly issuing consultations open to the public and collecting the necessary information, the Commission acts as a filter between society and EU institutions (Peterson, 1995). The European Commission has defined indicative rules to manage consultations in a White Paper on European Governance1 concerning the access and scope of the consultation, as well as procedures on the divulgation of the material submitted by each actor that joined.

Prior to the beginning of the consultation – usually lasting between six and eight weeks – the European Commission publishes online the scope of the public hearing, a description of the policy issue, a collection of relevant policy documents, as well as stakeholder groups that might be concerned by the policy initiative, or policy change. Any concerned party and stakeholder is entitled to submit a position paper (or more than one), as long as one of the liaison offices is located in one of the EU member states. The liaison office does not have to necessarily be the main headquarter of the stakeholder. Thus, companies from outside of the European Union which have an office in one of the EU member states can potentially submit position papers to the Commission during the consultation period and influence the policy draft. The Commission provides a preliminary description of the specific issues open for discussion. A questionnaire is afterwards divulgated among the stakeholders to narrow down the debate on topics that are of interest to the Commission (European Commission, 2002, 15-19). The questionnaire is usually divided into sections: an initial general part where the stakeholder describes its activities and general interests; a second part relative to policy preferences advocated; and a third final part focusing on policy instruments, timeframe and secondary policy details2.

After the closing date of the consultation, the European Commission publishes preliminary statistics including descriptions on the number and types of participants and a short summary of the main positions presented. Contributions received from stakeholders are published on the European Commission's website along with details of the organisations.

2 Templates of current and previous consultations' questionnaires are available at the following link: http://ec.europa.eu/yourvoice/consultations/index_en.htm
contributor can object the publication of its proposal if it would harm his or her legitimate interests. In this case, the contribution may still be published, but in anonymous form. Contributions from interest groups are usually drafted following the questions suggested by the European Commission and each position paper presents main policy preferences and instruments. In addition, some stakeholders may decide to submit more than one position papers to supply further information that are not covered by the questionnaire such as data and statistics.

The European Commission did not set any limit to stakeholders in the submission of position papers. Therefore, a company can individually submit its position paper alone and jointly, under a formal or institutionalised coalition. The consultations of the European Commission provide remarkable insights on public lobbying and policy preferences pursued by stakeholders and interest groups.

Lobbying is an activity that can take place in many other venues, both publicly and privately; it can target EU institutions, policy makers, or other stakeholders from all the sectors (Coen and Richardson, 2009). Due to the difficulty of accessing records of private meetings, or unofficial lobbying channels, this research will rely on the documents submitted during the consultation and established coalitions to infer dynamics behind lobbying strategies and coalitions’ formation. Private lobbying venues such as events, informal meetings and private communication channels (i.e. exchange of emails and letters) can still be relevant in the determination of coalitions and lobbying strategies. However, due to lack of systematic data collection, it is impossible to account for these venues.

The focus on consultations opened by the European Commission would minimise certain biases. First, each consultation includes a set of actors which all submitted position papers; thus, it will minimise the chances of having missing actors within the policy network. Second, documents submitted during the consultations are publicly available and comparable, due to the standardised format of the questionnaire provided by the European Commission. Third, the analysis of position papers presented during the consultation by interest groups allows to infer the existence of private lobbying strategies. For instance, a paper presented by a company may include a logo of, or references to a member of the civil society, or another company.

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3 During the 2030 consultation on energy and climate change, Statoil and BP – two oil and gas companies – have presented two documents: a position paper presenting answers to the questionnaire and a second document including data analysis and updated statistics.
It is common practice for individual actors to submit position papers that are homogeneous, or at least consistent between each other. However, this research highlights that this is not always the case.

This research will explore the “Consultation on Climate and Energy Policies until 2030” which took place from 28 March to 2 July 2013. This consultation received 550 formal position papers from a broad *spectrum* of stakeholders including 14 Member States (although not included in the population of this study). There was a high participation of business associations (41%), private companies equally balanced between intensive carbon leakage, energy and non-energy firms (8%), private and state-owned electricity grid companies (10%). Among the members of the civil society, NGOs were actively represented (8%), citizens (11%) and trade unions (2%) (DG Energy, 2013).

**Theoretical puzzle:**

Objective of this research is to understand coalitions’ formation and lobbying strategies. It is argued that these dynamics are able to explain why certain actors officially present contrasting position papers. The population considered in this research includes stakeholders displaying organisational structure, political and private interests. This entails that position papers submitted by EU member states, state-owned companies and citizens were not included.

A first overview of position papers displayed a set of opinions that were widely accepted and other that raised diverging positions. Large part of stakeholders welcomed the combination of climate change and energy into a single consultation. There was a strong recognition that the EU climate and energy policy should recognise the consequences of economic crisis, international developments and their potentially adverse effects on European competitiveness. On the one side, the economic crisis is responsible for the loss of competitiveness of many industrial groups in the EU (CEFIC 2013, 92-94). On the other side, by reducing global energy consumption, the economic crisis has also partially contributed to a reduction of CO2 emissions (Davis and Caldeira 2010, Peters and Marland 2012). Thus, certain industrial coalitions and stakeholders (i.e. CEFIC, BASF, Solvay, Borealis) advocated that future emission targets should include monitoring rules to accordingly rescale CO2 and greenhouse gas targets based on structural events, market conditions and shocks.

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Austria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Lithuania, Poland, Portugal, Romania, Slovenia, Spain, United Kingdom.
In spite of recent developments with Russia and the MENA region, many stakeholders from the private sector and members of the civil society agreed that the EU should increase its energy security by diversifying energy supply sources and routes. Among these stakeholders, oil companies (BP, Total and Shell), chemical coalitions (CEFIC) and several think tanks (CDF Climate) claimed the urgency to expand the gas pipeline system in Algeria and import LNG (liquid natural gas) from Australia and South-East Asia. The use of gas as a transitional source of energy for a more sustainable economy was campaigned by coalitions including private companies and members from the civil society. In particular, oil and gas companies were overall in favour of the exploitation of unconventional energy sources such as shale gas (European Commission 2015). The consultation showed broad consensus that the EU Emission Trading System should remain a central instrument for the transition to a low carbon economy and reach a reduction of greenhouse gas emissions. However, views diverged as to the extent a structural reform of the ETS was needed. Several electricity grid companies and coalitions (Iberdrola, Energy Partnership) recognised that additional policies would be necessary, especially to expand the EU Emission Trading System and include sectors that have been previously exempted such as transport, agriculture and housing (Harmsen and Eichhammer 2011).

Chemical and oil industries advocated that the EU Emission Trading System should be reformed to avoid overlapping with targets set in other environmental policies and instruments such as the Energy Efficiency Directive and the Renewable Energy Directive. To avoid overlapping targets, oil and gas companies proposed the development of single CO2 emission target applicable to all sectors calculated through a bottom-up approach. Following their proposal, the “single CO2 emission targets” should not be combined with other targets or policies. Private companies, mostly from the gas and oil sector, overall acknowledged the impact of human activities on global warming (Shell); however, they made clear that energy and climate change policies should not come to the detriment of industrial competitiveness. The benefits of the Internal Energy Market and the development of a transnational European energy grid – still under discussion and object of a set of separate consultations – were overall recognized by all

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5 Source: Position papers submitted during the consultation on “Energy and Climate Change Policies 2030” by: BP, Total, Shell, CEFIC, Borealis, CDC Climate.
6 Source: position papers from the “Energy and Climate Change Policies 2030”, Speech by Commissioner Arias Cañete at the Gas Infrastructure Europe 13th Annual conference (23 Apr. 2015)
the actors, including members from the civil society (WWF, CDC Climate). The development of the Internal Energy Market is perceived as a key tool granting competitive energy prices and energy security, able to avoid price distortion between member states. A related point was highlighted by some grid companies (Iberdrola) which advocated for the development of transnational grids able to divert energy surplus into other states. Industrial groups – European Roundtable of Industrials, CEFIC – advocated the need to stop any subsidy plan devoted to renewable energy, implying that fossil fuels should be kept in place, while waiting for more suitable technologies able to curb global warming. A few group of distribution, oil and gas companies (Shell, Iberdrola, OMV) detached themselves from the view expressed by their formal coalition and presented an intermediate position concerning renewable energy subsidies. These stakeholders advocated the need to keep subsidies for renewable energy sources; however, envisaging a progressive phasing out once renewable technologies achieve the economy of scale and become self-sustainable. Along these lines, public investments devoted to clean technologies and Research & Development were deemed essential to ensure the achievement of CO2 emission targets in Europe. However, alike subsidies for renewable energy sources, the same group of stakeholders asked that innovations that proved to be mature and well-integrated into the market, should envisage progressive phasing out of subsidies and tax exemptions from member states.

The consultation has identified some features, interesting from a theoretical perspective. Renewable energy lobbies may compete with each other; moreover, they can join coalitions that are far from energy-related domains, or climate change concerns. For instance, the German wind association created strong relationships with farmers’ interest groups and regional policy-makers. The final objective of this strategy was to build a strong coalition vis-à-vis EU institutions and other renewable energy sources they were competing with (Michaelowa, 2005). Natural gas companies have been traditionally lobbying together with oil companies, both informally and through the development of institutionalised coalitions (Deakin 1989, Markussen and Svendsen 2005). In the European Union, oil and gas associations have been usually working together to maintain subsidies to the oil industry and develop joint Corporate Social Responsibility strategies to preserve the interests of fossil fuels (Frynas 2010). After the negotiations related to the Kyoto Protocol; however, some natural gas associations have been promoting the development of formal coalitions including stakeholders from the gas and renewable energy sector. An example
in this regard is the European Partnership for Gas and Renewable Energy, which includes the oil company Shell and other stakeholders from the wind, gas and solar sector.

As previously mentioned, some groups of stakeholders may campaign under the same coalition but display different views and policy preferences, if compared to the ones of the members of the coalition itself. Views are not clustered by type of actors, nor by formal coalitions. Lastly, in some cases, an actor can submit different position papers with opposing policy preferences. For instance, Shell’s official position paper advocated against any form of energy subsidies altering market’s dynamics. It campaigned for a single CO2 emission target to not be combined with other targets on renewable energy, or efficiency. In addition to the previous position paper, however, Shell presented also a second one under the Coalition for Gas and Renewable Energy. The paper presented under the Coalition presents the following view:

The contributors to this submission are DONG Energy, First Solar, GE, Shell and Vestas. We have joined forces based on a shared vision that an ambitious framework for renewables electricity sources (RES) and Gas with binding legislation is urgently needed

(Position paper drafted by the Coalition for Gas and Renewable Energy, 2012)

Throughout the position paper submitted with this coalition, Shell reaffirms the importance of renewable energy subsidies (biofuel in particular) and other climate change measures. Why did Shell decide to join and support coalitions presenting views that are not fully in line with its main interests? Considering that Shell is also one of the founding members of the Gas and Renewable Energy Coalition, it might be difficult to understand the reasons motivating this apparently irrational lobbying move.

**Theoretical Framework**

The main theory combining explanations on coalitions’ formation and interests is the Advocacy Coalition Framework, by Sabatier in 1988. The Advocacy Coalition Framework identifies core interests as the prime glue able to explain the development of coalitions, their members and discourses within a policy subsystem. The theory defines interest in a hierarchical way: first, core interest, second, policy preferences, and third, secondary policy instruments (Sabatier 2009).

According to the ACF, the most important concept bonding actors together is the shared set of core interest. Core interests tend to be stable over time and across policy subsystems (Sabatier, 1988: 135). According to Sabatier (1988), they represent the values and attitudes pursued by stakeholders and interest groups, what determine their raison d’être. Examples may include liberal or conservative attitudes towards a particular policy issue (Weible Sabatier 2009, 122). For
instance, attitudes towards climate change could be more liberal or conservative. A stakeholder with a conservative approach would be in favour of flexible and non-binding measures tackling global warming determined by market-based dynamics (bottom-up). Conversely, a participant with less conservative views would lean towards binding policies determined by the state, or a treaty (top-down). Before the formulation of the Advocacy Coalition Framework, other scholars have recognised the importance of core interests in the determination of coalitions. Truman (1951) refers to core interest as ‘the common wants and desires of a set of individuals, realisable through public policy, that link a membership together’. Wilson (1973), Browne (1990), and Gray and Lowery (1997) argue that a coalition could become the population’s legitimate voice in the eyes of the policy-makers, if it mobilises large groups of stakeholders characterized by shared core interests. Therefore, based on the ACF, it is extremely unlikely that stakeholders owning different core interests could join the same coalition and advocate under the same voice.

A second important factor that brings actors together in the same coalition is determined by core policy preferences. Core policy preferences may still last over time and across policy subsystems; however, stakeholders can strategically adjust them to form coalitions, coordinate activities among stakeholders, include new ideas and experiences from other members of the policy subsystem. The reason why policy preferences are still cohesive is that they translate core interests into policy preferences that reflect attitudes and perceptions about climate change and energy preferences (Calanni 2014). Thus, based on this definition, it is likely that stakeholders within the same coalitions would still share core interests and develop similar policy preferences, although the latter can vary within the same group based on individual strategic considerations.

Policy instruments are the last important factor bonding actors together. Policy instruments can be shaped more easily than core interests and policy preferences. They tend to be more changeable over time as they are narrower in scope and geographical applicability (Sabatier 1998). The Advocacy Coalition Framework therefore posits that members within the same coalitions are likely to display different policy instruments and that these are not usually a determinant behind coalitions’ formation. Policy instruments depend on characteristics owned by the actors such as geographical location or scope (global, regional, national or local). (Sabatier and Jenkins-Smith 1999)

To summarise, the Advocacy Coalition Framework argues that policy core interests, in first place, and policy preferences, in second place, are pivotal in the formation of coalitions, establishment of alliances, and coordination of activities among members in the policy subsystem (Sabatier and Jenkins, 1993: 25-30). Regardless the level of conflict within a consultation, the homogeneity of
core interests and, to some extent, policy preferences should still play an important role in determining position papers.

As previously mentioned, the position papers submitted during the consultation on Energy and Climate Change does not follow what is expected by the ACF. Based on this theoretical framework, we would expect actors to cluster around core interests, not compromise and display certain levels of homogeneity when it is about core interests. Based on the ACF it would be very unlikely to see position papers expressing different views coming from the same actor – as in the case of Shell.

This paper argues that, while the ACF can still be used as a parsimonious theory able to explain coalition formation under relatively homogeneous contexts, the dynamics that bring actors together should not be ignored. The main idea of the ACF is that there is a hierarchy between interests pursued actors. This research, however, aims at identifying a more nuanced definition of interests which is not based on “hierarchy”, rather on intensity and relational factors. It is argued that each actor in the policy network will strategically use its membership with a plethora of coalitions to differentiate its lobbying strategy. Memberships can be used at convenience if a coalition is supporting one of the preferences advocated by an actor. Interests are not hierarchically ranked, as the ACF posits, because the intensity of policy preferences may differ from one actor to the other. Universally recognised core interests, other than being difficult to define, are not able to explain the variation in coalitions’ structures and position papers.

**Research Design: Definitions and methods**

Stakeholders joining the consultations of the European Commission can be conceived as a policy networks. A policy network is defined as a group of individuals and organisations specialised in a field of expertise and providing information to policy-makers (Biersteker 2014). Within a policy network, stakeholders organise their lobbying activities between each other and coalitions are the result of these coordinated activities (Stevenson 1985, Pattberg 2007). Coalitions have been defined in multiple ways by previous scholars. They can be broadly defined as structures constraining agents under the same common position, where the term “position” is usually referred to the policy preferences jointly supported in a position papers (Goddard 2004, Kluver 2012). Other scholars define coalitions on the basis of interviews aiming at identifying actors that more often cooperate in the achievement of a common interest (Holyoke, 2009; Hill and Varone, 2014). For the purpose of this research, a coalition is defined as a group of stakeholders that is
member of a formal business association representing the interest of an economic sector, or advocating for clearly identifiable interests and beliefs. For instance, the members constituting the European Chemical Association (CEFIC) represent one coalition. Based on this definition, a “coalition” would therefore be formed by the business association (CEFIC) and its members. The membership is usually formalised through the payment of a yearly fee to a coalition, or an association. This implies that, if a stakeholder does not want to be represented by a business association anymore, it will simply withdraw its membership. Business associations provide public information on the members and stakeholders that they represent. Moreover, NGOs can join associations as well. Lobbying through business associations is a common practice within consultations.

The theoretical puzzle can be better highlighted if we look at the policy networks of the coalition memberships of a selected sample of actors that joined the consultation on Energy and Climate Change. The following plot represents coalitions (in red), their members which can be companies (in blue), or NGOs (in green):
The network presents two main components: the first, clustering around CEFIC; the second, around the European Coalition for Renewable Energy and Gas (GAS&RE). CEFIC is one of the main interest groups representing chemical industries at the European level. Founded in 1972, it represents the interests of 29000 European chemical companies, both large, medium and small. The industries account for 1.2 million jobs and 14.7% of global chemical production which includes plastic polymers, fertilisers, and pharmaceutical products. In 2016, CEFIC has declared investing more than 10 bn € in lobbying activities (Source: EU Transparency Register). CEFIC is also a “coalition of coalitions” since it lists, among its members, business associations representing the Chlorine, Plastic and Fertiliser industry.

The European Coalition for Renewable Energy and Gas is a formal coalition established in 2012 to promote an energy mix based on gas and renewable sources. The five founding members are companies specialised in different sectors: Alpine Energie (bankrupted in 2013, specialised in construction and building), Dong Energy (a Danish company producing gas and renewable energy), First Solar (producing and installing solar panels), General Electrics (global company providing gas, steam power, nuclear and water plants), and Shell. CEFIC is also affiliated with other coalitions still representing the chemical industry, but with a different scope. For instance, IKEM is the chemical coalition in Sweden and SCHP in the Czech Republic. Some CEFIC’s members from the oil sector (Statoil, BP and Shell) are also members of the Zero Emission Partnership (ZEP), a think tank-NGO which established an official partnership to promote Carbon Capture Storage technologies (CCS). Alike CEFIC, ZEP includes also other coalitions whose members are not included to keep the sample small and more manageable.

The coalitions highlighted in the graph are very heterogeneous, including coalitions of coalitions, NGOs siding up with oil companies and not clustered by sector.

If it is to understand why coalitions overlap and why certain members decide to join coalitions with contrasting views, two further level of analysis have to be included: working relationships and policy preferences.

Existing theories are not new in assessing the role of working relationships on coalitions’ formation. Knocke (1999)\(^9\) explores how coalitions are not only bound by the sharing of financial resources but also social capital and know-how exchanged through informal relationships. Moreover, Hula highlighted the importance of interlocking directorates and revolving doors in linking coalitions on the basis of career patterns of its staff members.

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Interlocking directorates and revolving doors are two practices that allow employees of an organisation to accept roles in another company. Career moves, but also the participation to an event, or a joint project facilitate the flow of information and shared ideas. These connections can provide effective conduits for the coordination of information exchange and group strategy, simplifying the intelligence-gathering efforts that would otherwise be required of organisations desiring to pursue collective strategies (Hula, 57-60). To systematically collect data on working relationships, this research has divided them into two types:

1. Strong ties: Interlocking directorate, donations (money), shared board members, sponsorships
2. Weak ties: Participation in the same event, joint project, publications

Working relationships have been manually collected via online research. To be included in the data, the working relationship had to occur from 6 months from the opening of the consultation, until 6 months after, possibly reiterated over this timeframe. The idea behind this timeframe is to exclude occasional working relationships in favour of more established ones. Moreover, the working relationships had to fall within the scope of the consultation, or at least focusing on energy policy and climate change in the EU. For instance, a joint drilling project started in Mexico by Shell and Total would not count as “working relationship” in the policy network of the energy consultation. The following plot represents the working relationships of the selected sample. Black ties highlight strong working relationships, gray ties weak ones.
If compared to the previous plot representing established coalitions, this graph is more sparse and well-connected. An interesting case is represented by WWF (NGO), whose director of the European Office was also a member of the Sustainability External Advisory Committee of the Dow Chemical company\(^\text{10}\). The coalition network showed that NGOs tend to have a marginal role, or be at the periphery of the network. However, they seem to be more embedded when it is about building informal relationships with companies and institutionalised coalitions from different sectors. A second interesting case is still represented by Shell which, even in this case, displays strong working relationships with the Partnership for Gas and Renewable Energy (Gas&RE in the plot) and the chemical industry coalition (CEFIC), although it does not display any strong connection with its members.

\(^{10}\) http://ec.europa.eu/environment/archives/greenweek2012/tony-long.html
Coalitions are also used as a forum to share discourses and information; thus, we assume that policy preferences should reflect this relational aspect of coalitions.

The contribution brought by this research consists in the fact that position papers submitted during the consultations are deconstructed into a set of policy preferences, such as: energy efficiency, renewable energy, CO2 emissions, and subsidies. This research argues that there are two important discriminants bringing actors together on the basis of the policy preference:

1. Shared view (along the lines of core interests posited by the Advocacy Coalition Framework)
2. Intensity of a preference.

This research argues that the reason why some position papers have different views is because those views that differ are perceived not as important as others. The difference between preferences is not based on some hierarchical set of values and interests, core interests are not more important than policy instruments. Policy preferences are more nuanced, cannot be hierarchically clustered, and they reflect into different lobbying and coordination strategies. The main idea is that coalitions are strategically used to submit different position papers and differentiate the lobbying strategy of an organisation. Differentiating a lobby strategy can be important to increase the reputation of a company, collect updated information on competitors and policy development, and ultimately enhance influence on the European Commission.

Policy preferences are automatically extracted from each position paper with topic modelling. A topic model is a type of Bayesian statistical model for identifying the abstract "topics" that occur in a corpus of documents. Intuitively, given that a document is about a particular topic, one would expect particular words to appear in the document more or less frequently: "emissions" and "CO2" will appear more often in documents about climate change, “subsidies” and “technology” will appear in documents about renewable energy sources and “market” would probably appear in both topics. A position paper typically concerns multiple topics in different proportions; thus, in a document that is 10% about climate change and 90% renewable energy sources, there would probably be about 9 times more “renewable energy” words than “climate change” words. The "topics" produced by topic modeling techniques are used to define the policy preferences in a position paper. A topic model captures this intuition in a mathematical framework, which allows examining a set of documents and discovering, based on the statistics of the words in each, what the topics might be and what each document's balance of topics is. Collecting large amount of texts – as in the case of the Energy and Climate Change consultation
– a manual coding is simply beyond human processing capacity. The algorithm used in this research - **Latent Dirichlet allocation (LDA)** – is a generative statistical model, based on unsupervised machine learning. Unsupervised machine learning does not require any previous manual text coding, the topics are extracted from the texts based on the cluster of words that summarises a topic. LDA posits that each document is a mixture of a small number of topics and that each word’s presence is attributable to one of the document’s topics. The model generates automatic summaries of topics in terms of a discrete probability distribution over words for each topic, and further infers per-document discrete distributions over topics. Most importantly, LDA makes the explicit assumption that each word is generated from one underlying topic.

The following plots represent the cluster of words identified in each topic. The bar on the side of each word indicates a parameter (gamma) measuring extent to which a word is a discriminant for that specific topic. The higher the parameter, the more a word connotes a specific topic.

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The words identified in each topics are very similar, this occurred for two main reasons. First, the position papers used almost the same words to explain their policy preferences; second, the LDA model based on unsupervised machine learning algorithm, thus, it extracts the words without any guidance, or semantic instruction. The next step of this research will therefore move towards the use of a more precise algorithm for “labelled topic modelling”, another model belonging to the family of LDA algorithms which involves supervised machine learning. Due to the still preliminary stage of this research, an unsupervised machine learning algorithm was selected and – despite its possible difficulty in the interpretation – we can still infer latent topics covered by the sample. Moreover, before automatically analyse the position papers, manual coding has been conducted on 45 texts. The interpretation starts by looking at the words that have the highest score on the histograms. The following table summarises the topics identified by the algorithm.

| Description | 
| Topic One | The development of renewable energy and emission policies should be hedged by the state |
| Topic Two | Intermediate position asserting that measures for renewable energy sources lay in the hands of the state and the market |
| Topic Three | Importance of energy efficiency measures in tackling climate change, these measures should be developed at the state-policy level, rather than the market level. |
| Topic Four | Preference in favour of the development of new technologies to curb carbon emissions, these technologies should be supported both with private and public measures |
| Topic Five | Preference expressing concern for the industrial sector to bare the costs of climate change and energy measures adopted at the state/regional level |

At present, the topics are still difficult to interpret, this is a common problem when using unsupervised machine learning algorithms for text mining. However, as previously mentioned, this problem will be eliminated in the future with labelled machine learning algorithms. By labelling topics and training an algorithm, it will be possible to identify also topics that are

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difficult to extract because marginal in a text, or because of the similar recurring terms used in the corpus of texts.

Once topics are extracted, LDA calculated the percentage of the text covered by each topic. The following table summarises the results.

<table>
<thead>
<tr>
<th>Name</th>
<th>Type of actor</th>
<th>Topics (with %)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Basf</td>
<td>Chemical company</td>
<td>Topic 3 – 53%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 5 – 47%</td>
</tr>
<tr>
<td>Bellona</td>
<td>Think tank</td>
<td>Topic 3 – 100%</td>
</tr>
<tr>
<td>Borealis</td>
<td>Chemical/Fertilizer company</td>
<td>Topic 2 – 4%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 4 – 5%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 5 – 90%</td>
</tr>
<tr>
<td>British Petroleum</td>
<td>Gas&amp;Oil company</td>
<td>Topic 4 – 100%</td>
</tr>
<tr>
<td>CAN (Climate Network)</td>
<td>NGO</td>
<td>Topic 3 – 95%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 5 – 5%</td>
</tr>
<tr>
<td>CEFIC</td>
<td>Chemical industry association</td>
<td>Topic 5 – 100%</td>
</tr>
<tr>
<td>ClientEarth</td>
<td>NGO</td>
<td>Topic 1 – 100%</td>
</tr>
<tr>
<td>Coalition for Energy Saving</td>
<td>Energy Saving association</td>
<td>Topic 3 – 100%</td>
</tr>
<tr>
<td>COGEN</td>
<td>Cogeneration association</td>
<td>Topic 3 – 100%</td>
</tr>
<tr>
<td>DONG</td>
<td>Danish energy company</td>
<td>Topic 2 – 100%</td>
</tr>
<tr>
<td>DOW</td>
<td>Chemical Company</td>
<td>Topic 5 – 88%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 4 – 12</td>
</tr>
<tr>
<td>E3G</td>
<td>Think Tank</td>
<td>Topic 3 – 98%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 5 – 2%</td>
</tr>
<tr>
<td>ENEL</td>
<td>Italian energy company</td>
<td>Topic 2 – 34%</td>
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<tr>
<td></td>
<td></td>
<td>Topic 3 – 32%</td>
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<tr>
<td></td>
<td></td>
<td>Topic 4 – 27%</td>
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<tr>
<td></td>
<td></td>
<td>Topic 5 – 7%</td>
</tr>
<tr>
<td>EPPSA</td>
<td>Coalition of companies supplying power plants</td>
<td>Topic 2 – 100%</td>
</tr>
<tr>
<td>ESB</td>
<td>Irish energy company</td>
<td>Topic 4 – 100%</td>
</tr>
<tr>
<td>ETUC</td>
<td>Trade Union Coalition</td>
<td>Topic 1 – 10%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 4 – 77%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 5 – 13%</td>
</tr>
<tr>
<td>Enrelectric</td>
<td>Electricity industry association</td>
<td>Topic 2 – 19%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Topic 4 – 81%</td>
</tr>
<tr>
<td>Enurechlor</td>
<td>Chlorine industry association</td>
<td>Topic 5 – 100%</td>
</tr>
<tr>
<td>Company</td>
<td>Description</td>
<td>Topics</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-------------------------------------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>Euturbines</td>
<td>Gas and steam turbine manufacturers association</td>
<td>Topic 2 – 100%</td>
</tr>
<tr>
<td>First Solar</td>
<td>Photovoltaic company</td>
<td>Topic 2 – 100%</td>
</tr>
</tbody>
</table>
| Friends Earth                | NGO                                                  | Topic 1 – 85%  
Topic 3 – 10%  
Topic 5 – 5% |
| Gas & Renewable Partnership | Coalition promoting gas and Renewable Energy         | Topic 2 – 100%                  |
| Gas Natural Fenosa           | Gas company                                           | Topic 2 – 77%  
Topic 4 – 23% |
| General Electrics            | Private Company                                       | Topic 2 – 100%                  |
| Iberdrola                    | Spanish energy company                                | Topic 2 – 87%  
Topic 4 – 13% |
| INEOS                       | Chemical company                                      | Topic 5 – 100%                  |
| OMV                         | Oil and gas company                                   | Topic 2 – 11%  
Topic 3 – 57%  
Topic 4 – 17%  
Topic 5 – 15% |
| Plastic Europe               | Plastic industry association                           | Topic 5 – 100%                  |
| Shell                        | Oil and gas company                                   | Topic 4 – 81%  
Topic 1 – 9% |
| Solvay                      | Chemical company                                      | Topic 4 – 32%  
Topic 5 – 68% |
| Statoil                      | Oil and gas company                                   | Topic 2 – 87%  
Topic 4 – 13% |
| Vestas                       | Wind energy company                                   | Topic 2 – 97%  
Topic 4 – 3% |

The distribution of topics and the intensity of each preference highlighted that actors may have more than one preference with different intensities. For the purpose of this research, the length dedicated to each topic in the position paper is an indicator of the intensity related to each of them. The preferences have been afterwards ranked as “low” or “high” if they were respectively below or above 35%. The following network allows an interesting way to represent topics as it highlights which topics are more likely to go along together in the same position paper. Thicker ties represent stronger preferences for a specific policy measure. Topic One is represented in blue, topic two in gray, topic three in red, topic four in green, topic five in yellow.

13 In the final stage of this research, more sophisticated techniques based on sentiment analysis will be used.
The plot highlights some interesting cases. NGOs had a peripherical role within the coalition network. The working relationship network showed that they tend to be more engaged through unofficial channels, without joining any association formally. Contrarily to what we would expect by the ACF, their topic distribution seems to be relatively variegated and closer to all types of preferences. WWF seems to have collected all preferences from all the actors it engages working relationships with (for instance, its relationship with the chemical industry through DOW chemical). Topic 4 and 5 tend to overlap more often than other topics. Lastly, the plot visualises why Shell joined the Gas and RE partnership, due to its mild preference for renewable energy.
sources. Overall, we can also see how institutionalised coalitions (red squares) tend to have one single strong preference, while companies and NGOs tend to diversify their position papers.

**Conclusions:**
While parsimonious theories have stressed the importance of core interests at the basis of coalitions formation, the case of coalitions that participating in consultations of the European Commission does not seem to be fully explained. The paper has highlighted that coalitions in the field of energy policies tend to be disomogeneous in terms of members and including positions that are not always in line with the mainstream position adopted by the association.

By plotting the networks of a selected sample of coalitions and their members, their working relationships and the distribution of policy preferences and intensities, this research contributed to better understand micro-dynamics between the actors of a policy network able to explain macro-results. Coalitions may overlap and actors may present different policy proposals because actors in the policy network strategically use their memberships to differentiate their lobbying strategies. Whenever a coalition does not advocate for the whole set of preferences of an actor, the latter will join, or use, other coalitions to differentiate its lobbying strategies. This preliminary research unveils mechanisms behind coalitions formation, as well as lobbying strategies.
Bibliography:


