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EU Electricity Policy (Im)balance: A Quantitative Analysis of Policy Priorities Since 1986

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ABSTRACT

The European Union has produced hundreds of laws in the field of electricity policy in the last three decades, on issues ranging from nuclear disposal to renewable energy generation support. Is the EU electricity policy of the last 30 years balanced, according to the classical energy trilemma framework? An all-inclusive, quantitative, multi-decade examination of the EU energy policy is still lacking. Besides the traditional policy perspectives, policy density and intensity, this paper proposes a novel method to measure policy outcomes: policy importance. The results show that EU energy legislation is indeed imbalanced. Environmental concerns rank first among EU electricity policy priorities; however, since 2003, the creation of an internal market has started to challenge environment as the top priority. Furthermore, internal market policies tend to have a higher trend of adoption than environment. Security of supply is at the bottom of EU policymakers' attention. The EU energy policy is becoming more intricate, but not more revolutionary. Meaningful policy changes occur at a stagnating yearly rate, despite the increasing power of the EU institutions.

Keywords: Electricity Policy, Quantitative, Policy Density, Policy Intensity, European Union
JEL classifications: F530, Q480

1. INTRODUCTION

In any given work day, the Official Journal of the European Union publishes at least one piece of legislation related to energy. Only enumerating the title of binding rules covers more than 30 pages in the nuclear field alone. Using the World Energy Council (World Energy Council, 2020) framework of a classical energy trilemma between the competing energy priorities of affordability, security of supply and environmental sustainability, this article aims to shed a light over the existence or not of such balance in the European energy policy.

There are several attempts to analyse this equilibrium between policy priorities, but comprehensive, decades-long, quantitative studies are missing. In a strategy paper for the French government, the offset between electricity prices and environment measures is studied, arguing that the electricity sector is in crisis, aggravated by an electricity generation oversupply (Auverlo et al., 2014). A long-term analysis of the legislative output in the EU energy sector, probing for policy patterns, concludes that neither incremental progress nor punctuated equilibrium satisfactorily explains the patterns of EU policy-making, stopping short of giving a verdict on policy balance (Benson and Russel, 2015). In another article, the balance between climate change and the internal energy market policies is investigated, and the conclusion is that both will fail, unless refocused (Helm, 2014).

This paper intends to solve this puzzle of assessing the balance between European energy priorities in two steps. The first step is quantifying all legally-binding legislation (a policy density perspective), then all policy instruments such as targets and objectives (a policy intensity perspective) and, in a novel approach, valuating those targets and objectives according to a self-developed taxonomy (a policy importance perspective). The quantification is done at two levels: pillars (energy priorities defined according to the classical energy trilemma) and categories (a more refined

classification of priorities). The second step is assessing the balance of energy priorities through all three perspectives (density, intensity and importance), but also recognizing patterns in EU policymaking and identifying gaps in EU policy. The empirical database created, including about 8,000 data points, allows many more applications, this article focusing on assessing the EU energy policy (im)balance and on recognizing policy patterns.

The question addressed by this article is quantitatively determining if the European electricity policy is in the balance suggested by the classical energy trilemma framework. Assessing the policy (im) balance is useful, as it allows to identify policy gaps and to explain the roots of tensions with major stakeholders, such as members states. This paper also aims to give quantitative arguments in the centralization versus liberalisation debate, noting the inclusion of "internal energy market" as the fourth energy priority.

The article is divided into seven parts: an introduction and a background, followed by a presentation of the analytical framework employed, including the methodology. The empirical results are separated into the three developed policy perspectives: policy density, policy intensity and policy importance, each displaying their own findings. Finally, the discussion and the conclusions respond to the questions addressed by the study: proposing a ranking of EU ambitions, assessing their balance, or lack thereof, and discussing the evolution of those priorities.

2. A STOCK-TAKING EXERCISE ON THE CURRENT DEBATE ON ENERGY PRIORITIES IN EUROPE

While energy and politics are generally intertwined at global level, in the EU case liberal market thinking was for decades the main guide (Talus, 2017). Liberalisation and EU energy market integration came hand in hand, in consecutive energy reforms (KU Leuven Energy Institute, 2015). Hence, different strands of literature are trying to reconcile major policy priorities, such as security of supply, environment or affordability, with the EU energy market liberalisation, in multiple, fragmented debates. However, a comprehensive analysis of how the EU priorities have evolved over time is missing.

The security of supply – liberalisation debate is impeded by the vague notion of security of supply (Ang et al., 2015; Chester, 2010). Nevertheless, some authors note that EU energy security was often used as justification for further market integration (Huhta, 2020; Judge and Maltby, 2017). A lively debate resulted from the introduction of capacity mechanisms (Eurelectric, 2016) and their compatibility with the internal market (Brunekreeft and Meyer, 2019; Hawker et al., 2017; Özdemir et al., 2020).

The affordability – liberalisation debate became more prevalent since the establishment of the Energy Poverty Taskforce and the European Energy Poverty Observatory in 2016. The debate suffered as well from unclear definitions of conceps (Deller, 2018; Thomson et al., 2016) and an early study found that liberalisation did not equate to affordability, at least for the most vulnerable consumers (Poggi and Florio, 2010).

The environment – liberalisation debate is well-known and goes at the heart of the liberalisation argument. The main critique is that too high environmental externalities would occur in the energy generation and distribution chain (Hammond and Jones, 2011). In the EU energy sector, it is argued that not enough climate policy integration is employed to reach long-term climate policy objectives (Dupont and Oberthür, 2012)

There is a decades-long discussion over the merits of liberalisation in the energy sector. On one hand, some authors note that lack of competition due to inevitable natural monopolies in generation and distribution and the widespread lack of information for actors on this particular market, would unavoidably create energy market failures (Aalto, 2014; Foley and Lönnroth, 1981; Goldthau, 2012; Greening and Jefferson, 2013). The 2001 California shortage of electricity supply is portrayed as another example of market failures (Wen and David, 2001).

On the other hand, European energy liberalisation is praised, mainly owing to providing cost reductions and price finding. Looking at the changes to electricity markets due to liberalization, Joskow concludes that liberalization brought significant costs reduction without compromising quality of service. The primary problem is if the regulators can resist to group pressures (Joskow, 2008). Pollitt discusses the energy policy liberalization since the 1980s, looking at several aspects of the market, including electricity, climate policies, coal subsidies and their effects, concluding that it had positive, but limited effects (Pollitt, 2012). Using an innovative measure of electricity price, the EU annual average real price, an analysis focusing on the legal developments for power utilities finds that the early effects of liberalization are reduced electricity prices (Jamasb and Pollitt, 2005).

Similarly, investigating the relationship between investment and regulatory regimes, from the perspective of electric and gas utilities in several EU member states, over 1997–2007 decade, a study finds that private ownership provides higher investment rates (Cambini and Rondi, 2010). For example, in the UK, the energy market privatization in the 1990s provided increased net efficiency gains, doubled labour productivity, increased government revenues (sales and taxes) and offered better prices for consumers (Domah and Pollitt, 2001). Finally, the liberalized energy market policy is shown to achieve some success particularly for the new EU member states, on costs reduction and competition (McGowan, 2008).

In terms of energy policies mapping, Kanellakis, Martinopoulos, and Zachariadis record diligently the existing regulatory landscape, creating categories for various electricity market parameters (Kanellakis et al., 2013). Their article is a benchmark against which this article's own empirical analysis may be compared. However, while their stock-taking exercise is extensive, the research is not aiming specifically at quantifiable targets, as this article intends. Another comprehensive analysis of EU electricity policies is done by Ignacio Pérez-Arrriaga (Pérez-Arriaga, 2014), the editor of

the *Regulation of the Power Sector* book. The book methodically describes the evolution of the electricity market design, explaining the motivation for each design adjustment. However, the book is intended as a manual and it does not provide a legislative analysis, but rather a historical outlook and a regulator's perspective.

The political science scholarly literature discussing the merits of liberalisation is developed and rich, but fragmented. While there is ample research on various approaches to normative policy design and policy priorities, there is relatively little on their mapping, evolution, balance or patterns, presented in a detailed, comprehensive and quantifiable analysis.

This article aims to fill those gaps by offering an all-inclusive and quantifiable measurement of the degree of attention given by European policymakers to the competing energy policy priorities, using a novel methodological analysis (policy importance). Such measurement is then applied to find policy imbalances and explore what would those imbalances mean for the current policy debate and to the crisis that some authors mention (Helm, 2014), if current policies continue without balancing.

3. DEVELOPING AN ANALYTICAL FRAMEWORK FOR MEASURING THE EU POLICY OUTCOMES

Filling the existing gap is achieved by analysing the objectives and targets of the EU electricity policy since 1986, when the single european act was adopted (Council of the European Communities, 1986). This document expanded significantly the powers of European institutions and gave a timetable for the creation of the internal market, one of the energy pillars analyzed. The objectives and targets are then classified at two levels: pillars, according to the classical energy trilemma, and categories, a more refined classification of priorities.

The first level of the analysis, the classical energy trilemma, was proposed by the World Energy Council and means: energy *security*, e.g. no power cuts; *environmental* impact mitigation, e.g. decarbonisation and air quality; and social equity or *affordability*, i.e. accessibility and affordability of electricity across the population (World Energy Council, 2020). The advantage of this classification is that it acknowledges that achieving the three goals simultaneously is often a delicate balancing act, sometimes a zero-sum game. Those priorities were encoded as pillars: affordability, security of supply and environment; to which internal market was added due to the significant European importance. The balancing act is given by the fact that pursuing an energy pillar often, but not always, means trade-offs with the other pillars (World Energy Council and OLIVER WYMAN, 2015); for example, environmental sustainability may be at odds with affordability, or affordability with security of energy supply.

The second level of the analysis is a detailed cataloguing of priorities, based on Kanellakis, Martinopoulos and Zachariadis's proposal (Kanellakis et al., 2013). While the energy trilemma implies competing priorities, this cataloguing recommends a cooperative arrangement, where different energy priorities are defined by their field, not purpose. Hence, a new catalogue was created, with eight categories: renewable energy; energy efficiency and savings; internal energy market; security of energy supply; environmental protection; nuclear energy; nuclear research; and research and development.

Besides categorizing the policy priorities, different perspectives for policy analysis required examination. One theoretical strand looks at policy outcome, searching if the policy adopted solved the problem that was supposed to solve (Bondarouk and Mastenbroek, 2018; Tosun, 2012). This analytical framework comes in contrast with policy output, which looks at policies taken in response to a societal problem at the point of adoption. The critique of a policy outcome approach is that the policy effect is hard to isolate; for example, there could be implementation or adoption problems in member states, as some authors suggest (Knill and Duncan, 2007).

In the vein of the policy output perspective, two methods are proposed: *policy density*, which is the number of policies put in place to reach a policy goal, and *policy intensity*, which focuses on the content of the policy instruments (Bauer and Knill, 2014; Bondarouk and Mastenbroek, 2018; Knill et al., 2012; Schaffrin et al., 2015). For our comprehensive research purposes, the policy density and policy intensity analysis fit best, as they unearth a large volume of pieces of legislation and targets, which allow measurement of the most impactful legislation and years, evolution in time, trends and ranking of policy priorities.

However, policy density and policy intensity perspective have the drawback that major, binding targets are on the same scale as an obligation to send a report, for example. The toolbox provided by policy density and policy intensity analysis does not differentiate between those targets. To eliminate this limitation, a novel, third perspective, *policy importance*, was created by grading each target and objective, according to own criteria. This way, the indiscriminate measurement of targets is eliminated and ground-breaking targets differentiate from lesser ones, allowing a finer view of policy targets.

To test the precision of our three perspectives, each chronological display of pillars and categories was juxtaposed, for each perspective, against the adoption year of the energy packages. This trial measures how well the new perspective fares compared with the traditional policy density and policy intensity. Energy packages are legislative cycles starting when the European institutions are adopting major reforms. As an energy package has a cycle of about 6–7 years and new major proposals from the Commission for the energy market design were adopted in November 2016, it was considered, for testing, as a new energy package.

3.1. Methodology

In order to measure the policy density, policy intensity and policy importance of the European Union's electricity policy a database was created, quantifying each individual target and objective of EU binding legislation in the electricity sector. The electricity sector refers to electricity-related pieces of legislation only, eliminating for example the legislation referring to vehicle or maritime fuel.

Binding refers to the EU documents with legal effects: Regulations, Directives and Decisions. Regulations are binding legal acts, with detailed provisions. Directives set objectives which member states have to achieve by devising their own laws. Decisions are also binding legal acts, with a deadline to comply with, but applicable only to whom they are addressed (European Union, 2017). Delegated acts or regulatory technical standards are not included. While they are binding, they do not provide targets or objectives and would clog the study.

The empirical data collection starts from 1986, taken as a starting point for European markets by much of the literature (Black, 2013; KU Leuven Energy Institute, 2015) and continuing until 2018. The identified target/objective was coded along 11 dimensions: (1) The binding obligations/targets in a short résumé; (2) quantifiable/not quantifiable; (3) the pillar; (4) the category; (5) the exact provisions, quotes from legislation; (6) the importance, added in order to differentiate the importance of regulations, given a grade from 1 to 4, where 4 is the highest; (7) the full title of the legislation; (8) the link to that legislation; (9) the stage of the legislation, meaning the energy package including that legislation; (10) the year when the legislation was published; (11) if still in force or by which legislation was repealed.

The empirical research led to about 300 pieces of binding EU legislation in the electricity sector, reuniting around 700 obligations/targets in about 30 years of data, and over 8000 tags. The own cataloguing system gave an *importance* number, one to four, to each legislation, target and objective, according to a predefined rulebook, as below:

- 1 = small: project with budget under 20 million EUR/year; minor development (such as updating the list of projects of common interest or establishing an experts' group); foreign affairs (such as treaties on collaboration with other countries);
- 2 = increasing: project with budget under 50 million EUR/year; member states to inform Commission; guidelines (Commission empowered to draft delegated acts); Commission reporting (to the Parliament and to the Council); medium development (such as obligation of member states to form independent gas/electricity authorities);
- 3 = significant: project with budget under 100 million EUR/year; targets given/diluted (legislation setting up, increasing or reducing quantifiable targets for member states to achieve, for example GHGs reduction); expansion of (Commission's) duties; new EU programme established; important development (such as member states obliged to set up GHGs national inventory systems or establishing a European programme on environment);
- 4 = large: project with budget over 100 million EUR/year; major expansion of (Commission's) duties; major development (such as unbundling of electricity and gas companies or common rules for the electricity market); new EU body (or scheme) established.

The EU energy policy balance is investigated in gradual steps, through the pillars of the classical energy trilemma (affordability, environment, security of supply, internal market) and through separate categories (renewable energy; energy efficiency and savings; internal energy market; security of energy supply; environmental protection; nuclear energy; nuclear research; and research and development) through the lenses of three perspectives (policy density; policy intensity and policy importance). This matrix with six cells (pillars/categories on one axis; policy density, intensity and importance on the other axis) is investigated for each result in the sections below.

4. POLICY DENSITY – CONSTANT ATTENTION TO THE "ENVIRONMENT" POLICY PRIORITY

There are 291 binding pieces of legislation in the electricity domain from 1986 to 2018 published in the Official Journal of the European Union. Displayed chronologically, they show ebbs and flows, but clearly exhibiting an increasing trend. The 2001–2010 decade seemed particularly fruitful in terms of adopted legislation. In general, more pieces of legislation are adopted each year by EU policymakers. However, policy density seems to miss the appearance of energy packages. Those two observations condense the advantages and drawbacks of the density analysis: showing trends, but missing qualitative developments.

In terms of number of pieces of legislation, the investigation shows a strong dominance of the "environmental" pillar. Almost half of the EU electricity legislation is having environment as the main objective (e.g. Council Regulation 1210/90 on the establishment of the European Environment Agency; Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading).

"Affordability" and "internal market" pillars follow with about equal shares, roughly a quarter (e.g. 94/799/Euratom: Council Decision adopting a specific programme of research and training in the field of controlled thermonuclear fusion; Directive 96/92/EC concerning common rules for the internal market in electricity). Finally, only a few pieces of legislation are dedicated to "security of supply" (e.g. 97/7/EC: Council Decision repealing Directive 75/339/EEC obliging the Member States to maintain minimum stocks of fossil fuel at thermal power stations; Regulation 1407/2002 on State aid to the coal industry).

If each policy priority is followed, on an individual progression (Figure 1), the results show no obvious domineering policy priority. With the exemption of "security of supply," all other policy priorities have years when they are on top. In 2001 and 2013, "environment" reaches unprecedented highs, which hints at important pieces of legislation published in those years (e.g. Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants; Regulation (EU) No 525/2013 on a mechanism for monitoring and reporting greenhouse gas emissions). However, regarding trends, "environment" is the only one seeing an increasing tendency, while "internal market" and "affordability" are rather flat. Notably, there is a distinct declining trend for "security of supply."

4.1. Categories

Looking at the data from the categories' perspective, there is a constant presence of "environmental protection" and "nuclear

research" categories in almost all years. "Nuclear energy" gets constant attention since 2002, while "energy efficiency and savings" picks up pace since 2004. "Research and development" flare up only every couple of years, the same as "renewable energy."

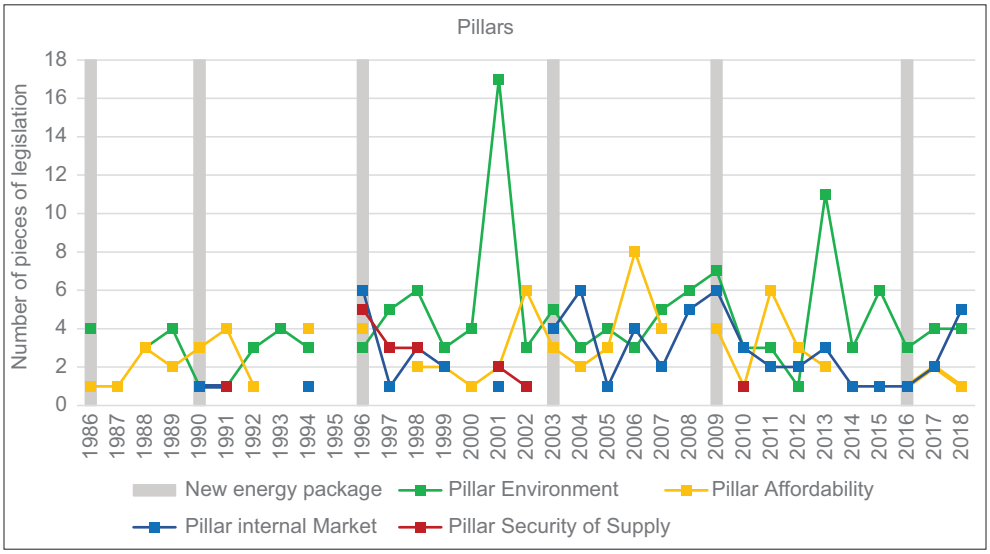
If categories are plotted in a chronological graph (Figure 2), a large spike is observed in 2001 (e.g. Directive 2001/80/EC on the limitation of emissions of certain pollutants into the air from large combustion plants; Directive 2001/81/EC on national emission ceilings), followed by a clear dominance of "environmental protection" legislation after 2013 (largely due to the development of the EU emissions trading system legislation).

In terms of percentage of total adopted legislation, out of the eight categories, "environmental protection" makes a third, followed by "nuclear research" with about a quarter of all legislation. The two categories together represent more than half of all European electricity legislation. "Nuclear research" and "nuclear energy" add up to 36%, meaning that more than a third of the legislation is dedicated to the nuclear sector.

4.2. Policy Density Perspective - Conclusions

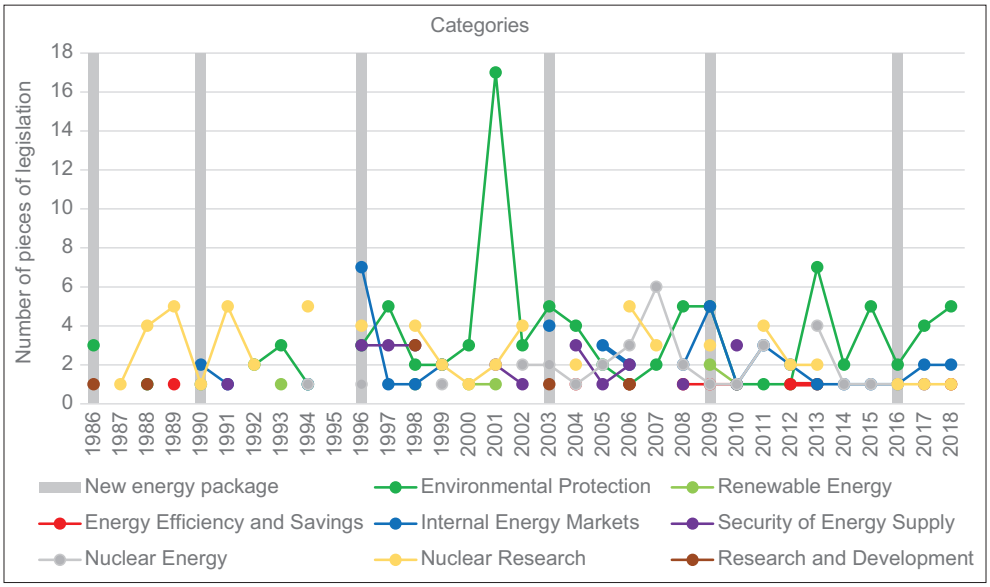
Putting all the observations above together, firstly, more legislation is adopted on annual basis. Nevertheless, rarely more than 4-5 pieces of legislation of the same classification are adopted in a year. Secondly, we find a clear ranking of energy priorities, identified by both our classification methods. Topping the rank of EU policymakers' attention is "environmental protection," followed by "internal energy market" with "security of supply" having least attention. "Nuclear energy" and "nuclear research" together have more than a third of all pieces of legislation, dwarfing "renewable energy" as the other named energy source.

Figure 1: Pillars – policy density – chronological, energy packages



Source: author's elaboration

Figure 2: Categories – policy density – chronological, energy packages



Source: author's elaboration

In terms of consistency, with the noticeable exception of 2001, when environmental legislation skyrockets (due to several pieces of legislation tackling air pollution, such as Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants), there is a remarkable steadiness of legislation adopted by the European institutions, with rarely more than 4–5 pieces of legislation of the same kind in a year.

On individual policy priorities, "environment" has a dedicated piece of legislation almost every year, for more than three decades. "Internal energy market" has also consistent attention from policymakers, particularly after 2003. Other policy priorities come as a group, with 2–3 years of intense effort on a particular policy, such as "nuclear research," followed by a break. This leads to the conclusion that it is not the number of pieces of legislation that makes an energy package, but the importance of provisions in it.

However, while policy density offers some important glimpses into the EU policymakers' attention towards various energy priorities, classification of an entire piece of legislation as one policy priority hides provisions with a different intent. Policy density is a rather raw way to analyse policy priorities. Consequently, a more in-depth examination is needed for definite results.

5. POLICY INTENSITY – GATHERING PACE FOR "INTERNAL MARKET" POLICY PRIORITY

Building on previous data, the investigation turns towards policy *intensity* analysis, which looks at the content of legislation. This perspective is more complex and more challenging, as each target and objective had to be labelled. If in the previous section analysis there were 291 pieces of legislation to quantify and display, this section classifies 685 targets and objectives.

Taking a step back and looking at trends for all policy targets and objectives, there is an undoubtable increasing trend. There are several cyclical yearly spikes, an indication of legislation adoption in waves. Additionally, the precision of the policy method is verified by its power to identify energy packages. This test is performed by juxtaposing the adoption year of an energy package over the chronological evolution of the policy targets and objectives. While some energy packages are correctly guessed, there is not enough precision to make correct measurements. Nevertheless, the method reveals some useful insights.

From a pillars' perspective, "environment" and "internal market" are dominating the policy priorities, but while "environment" is adopted in almost every year, "internal market" is significantly more present since 2003. "Affordability" is also a constant presence, but less than "environment" and almost disappearing since 2014. "Security of supply" pillar has an irregular presence, with no clear pattern. In terms of percentual number of targets and objectives, "environment" and "internal market" make more than two thirds of all EU electricity-binding legislation. "Affordability" is half the numbers of "environment", while "security of supply" is in last place, with only 6% of all legislation.

If each pillar's progression is examined (Figure 3), "environment" and "internal market" pick up policymakers' interest significantly after 2001 and, excepting a few years, alternate at the top of energy priorities. "Security of supply" is clearly at the bottom of policymakers' attention with the least number of targets and objectives. Looking at trends, both "environment" and "internal market" have increasing trends, with the latter actually overcoming "environment" in recent years. Pillar "affordability" is slowly increasing in targets and objectives (e.g. Decision No 647/2000/EC for the promotion of energy efficiency – SAVE II, oferring larger funding than SAVE I), while "security of supply" is rather stable, with a very low base (e.g. Council Regulation 1407/2002 on State aid to the coal industry has provisions where state id to the coal industry may be considered compatible with the proper functioning of the common market, under certain conditions; Regulation 994/2010 states that gas transmission system operators need to find bi-directional cross-border solutions).

5.1. Categories

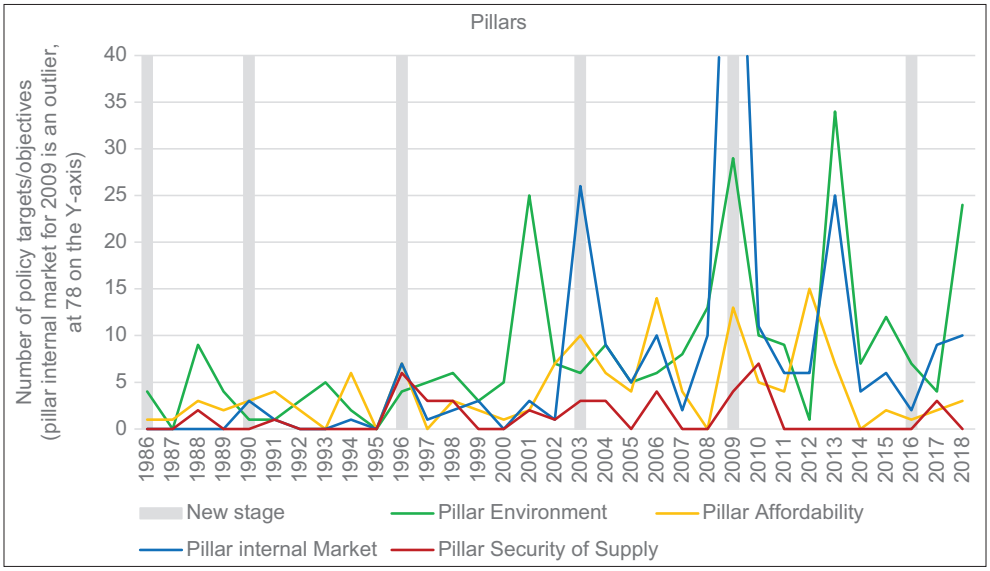
The categories classification of energy targets and objectives shows constant attention to "environment," with targets and objectives adopted almost every year. "Internal energy market" progresses in ebbs and flows, but gets significant attention after 2003. Other categories have a cyclical development, with 2–3 years of intense effort, followed by a break of several years.

Looking at the percentual number of EU electricity-binding legislation, there is a distinct ranking of energy priorities. The top spot is taken by "internal market" with almost a third of all targets and objectives. This is closely followed by "environmental protection" with about a quarter, while third place is "security of supply" with half the targets of "environment". However, if the two categories of nuclear are taken together, "nuclear energy" and "nuclear research," they would place jointly on the third place. At the bottom of policymakers' attention is "renewable energy" and "research and development."

Analysing the chronological evolution of categories, "internal market" and "environment" are ranking at the top of attention of policymakers. "Environment" seems to receive more consideration since 2015. "Security of supply" shows clearly a cyclicity in energy policy attention, with many targets adopted in 1996, 2003, 2010, 2013 and 2017. Trends are difficult to analyse as data is too sparse, making it impossible to determine what direction policy priorities are taking from a categories' perspective.

Finally, by juxtaposing the adoption year of an energy package over the chronological display of categories' evolution, the policy intensity analytical method could be investigated if it is a precise enough toolbox to determine what literature recognizes as energy packages. The findings show that while some adoption years of energy packages can be seen, there is no consistent identification. Nevertheless, it is worth noting that the more complex the analysis, the closer is the match to identify energy packages. For example, the most complex toolbox so far, policy intensity and categories, correctly notices a bump in "internal market" targets and objectives in four out of six energy packages adoption years.

Figure 3: Pillars – policy intensity – chronological, energy package, trends



Source: author's elaboration

5.2. Policy Intensity Perspective - Conclusions

In conclusion, the empirical results from a policy intensity perspective analysis are ambiguous over the ranking of policy priorities. While from the perspective of the classical energy trilemma, "environment" tops the raking of priorities, from the perspective of categories, the "internal market" is the dominant priority. It could be argued that "renewable energy" category is belonging to the environmental field, which would change the standing of priorities, however, "renewable energy" could also support energy independence. Therefore, "internal market" is crowned as the most pursued policy of this analysis perspective.

The results also show an increasing trend of targets and objectives added each year. On average, a piece of legislation from 2018 has more targets and objectives than one from 1990, for example. Looking at individual policy priorities from the energy trilemma perspective, it is worth noting that there is a trend for the "internal market" to overtake "environment" as the main energy policy priority in the European Union. Particularly from 2003, there is concerted effort from policymakers towards building the internal market. Furthermore, policy priorities appear in cycles, with 2–3 years of intense effort, followed by a break of several years. This is valid for most of policy priorities, except "environment" which receives persistent attention. EU policymakers adopt every year new or updated targets and objectives in the field of environment.

Finally, intensity policy analysis is insufficiently precise to detect energy packages. However, a pattern is found, indicating that the more precise is the classification and analysis adopted, the more energy packages become clearer to detect. The analysis points to the fact that further precision, more accurate instruments, would be able to offer better insight in determining the ranking of EU energy policies. Therefore, the next section follows up with the policy importance analytical framework.

6. POLICY IMPORTANCE – "ENVIRONMENT" TOPS THE POLICY RANKING, BUT "INTERNAL MARKET" CLOSELY FOLLOWS

Finally, a third layer of analysis is added, an original policy perspective, the policy importance. While various pieces of legislation have targets and objectives, not all are equal in importance. Some targets are impactful, such as setting new pollutant limits, creating new European agencies or splitting monopolies, while others present only the obligation of the European Commission to report the implementation of a policy to the European Parliament and to European Council, for example. Employing only the two perspectives displayed above, results would be skewed in favour of volume and not on impact. Therefore, a new taxonomy of EU energy policy targets and objectives was created, according to a self-developed system, detailed in the methodology chapter. This third viewpoint benefits from the policy intensity perspective, adding a grade according to importance to each target and objective of every piece of legislation within our defined scope.

Regarding tendencies (Figure 4), there is an increasing trend in importance of legislation on an annual basis, but a flat trend for the importance of objectives and targets. Importance of legislation means all objectives and targets multiplied by their points divided by the number of pieces of legislation in that year. Importance of objectives means average importance of objectives and targets in a year. This outcome shows that the EU energy policymaking is producing pioneering provisions at a very stable rate, an almost flat curve. While each piece of legislation is becoming more intricate, with more objectives and targets per piece of legislation, this does not reflect in the average importance of those objectives and targets. Most of them are only low importance, meaning that the legislation is unnecessarily complicated.

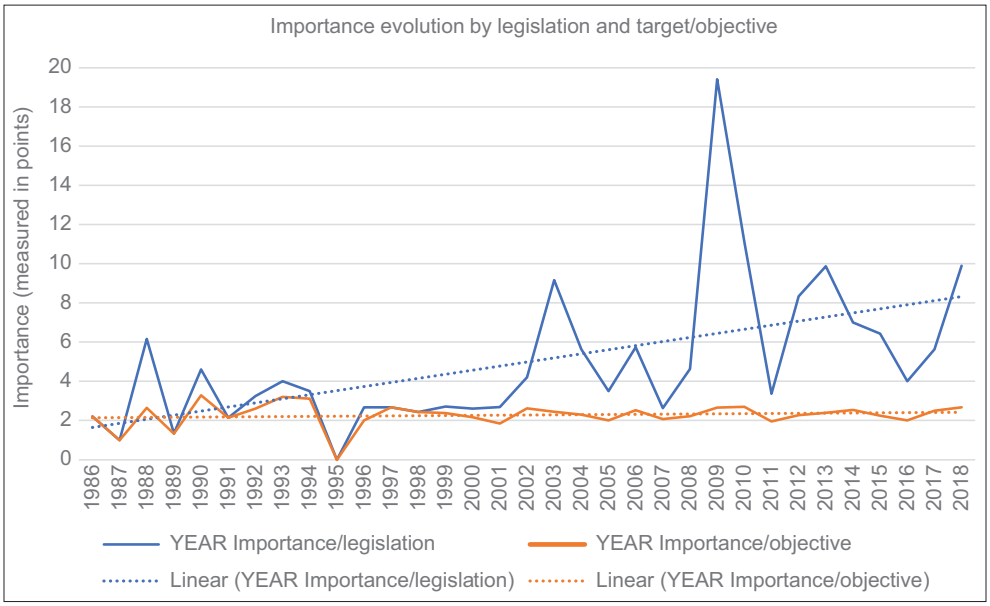
The outcome of the empirical research from an energy trilemma perspective largely follows the previous analyses: a skyrocketing policy ambition in 2009, bumps in 1996, 2003 and 2013; an ebbs and flows in energy policy adoption, but with an increasing general trend. These results are condensing what could be the most accurate display to the question of the degree of ambition of the energy policy of the European Union.

Examining the points percentage for each pillar, "environment" ranks first, followed closely by "internal market," then "affordability" and "security of supply". This ranking is consistent with earlier findings. In a chronological display of pillars (Figure 5), "environment" and "internal market" are alternating, both topping the policymakers' attention in most years. "Affordability" and then "security of supply" policy priorities follow far behind.

Looking at trends, "environment" and "internal market" have almost identical increase rates, a clear competition between the two for the top spot of EU energy policy attention. "Affordability" is ranked third, with a moderate increase rate. Finally, "security of supply" trend rate seems flattened, with no increase. Furthermore, this is visibly an increasingly accurate identification of the start date of energy packages, as the figure shows, even without having the points stacked.

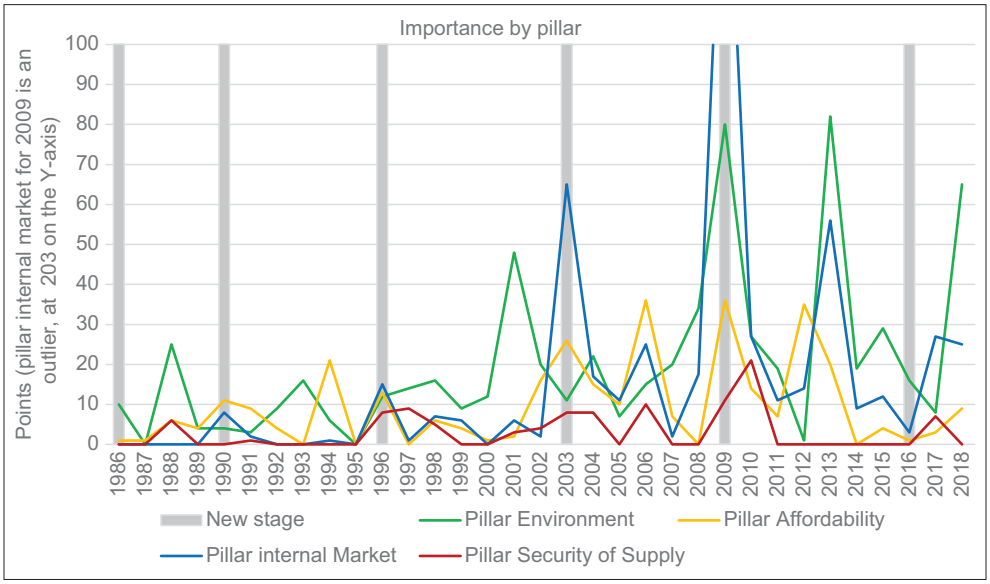
Finally, making a comparison between pillars from the perspective of the highest graded targets and objectives (three and four-graded policy objectives and targets), "environment" policy priority has

Figure 4: Policy importance – overall trends



Source: author's elaboration

Figure 5: Pillars – policy importance – chronological, energy packages



Source: author's elaboration

the most ground-breaking, major targets and objectives. However, for the second place, "affordability" is not far from "internal market," showing that while "internal market" has numerous targets and objectives, they are not as important as their number would imply. "Affordability" punches higher than the number of targets and objectives tagged as such.

6.1. Categories

If the categories' classification is employed, there is a constant, yearly attention to "environmental protection." "Internal energy market," particularly after 2003, receives persistent attention as well, with some years even booming, such as 2009 and 2013. Other categories are less popular and their presence is not on a yearly basis, but more as cycles of 2–3 years followed by an interruption of a couple of years, such as "security of energy supply" or "nuclear research."

Looking at percentual numbers, "internal energy market" has about a third of all points, followed by "environmental protection" and, third, "security of supply." Additionally, as in the pillars' section, a comparison is made between pillars from the perspective of the highest graded targets and objectives. "Environmental protection" tops the rank by far, followed by "internal energy market" and "security of supply" on the third place.

On a chronological basis, the prominent categories are "environmental protection" and "internal energy market", flashing on top of the energy policy ranking. After 2009, "environmental protection" seems to lead the ranking, with policymakers giving the most attention to this policy priority. As a notable exception, "security of supply" category leads in 2010 and 2017. To test the precision of the policy importance perspective, energy packages adoption year are juxtaposed with the chronological display of categories by the policy importance analysis framework. The results show an accurate tracking of the energy package adoption, which proves the value of policy importance as a toolbox to identify ground-breaking energy developments in the EU energy policy field.

6.2. Policy Importance Perspective - Conclusions

In conclusion, the empirical research displayed an increasing trend on an annual basis in importance of legislation, but a flat trend for the importance of objectives and targets. Many of the new objectives and targets have low importance and could very well be eliminated without affecting the policy steering. For example, the Regulation 714/2009 on conditions for access to the network for cross-border exchanges in electricity has no less than 33 targets and objectives. Regulation 715/2009 on conditions for access to the natural gas transmission networks has 24 targets and objectives.

The policy importance analysis shows "environment" and "internal market" as the main energy policy priorities of EU policymakers, followed, far behind, by "affordability" and "security of supply". Both the former policy priorities are tied in trends and receive continuous, annual attention from policymakers through new adopted targets and objectives. While "internal market" tends to dominate in volume, meaning number of points, "environment" received higher attention in recent years, after 2013. Therefore, delving into the trailblazing targets and objectives, those graded highest in our methodology, "environment" appears as the most pursued policy. Most ground-breaking provisions are in the field of environment (for example, creating an auctioning of allowances system for the reduction of GHGs; introducing guarantees of origin for renewable energy supply; the decision to sign the Paris Agreement), adding the most changes to the EU energy landscape.

A clear comparison between "affordability" and "security of supply" cannot be made, as they do not have an equivalent in both pillars and categories. From a pillars' perspective, "affordability" dominates and "security of supply" takes the last place.

Finally, the policy importance toolbox proved very accurate in detecting energy packages, all adopting years being in areas with high targets and objectives' importance. From both pillars and categories' standpoint, the highs correspond with an increase in "internal market" energy policy importance, meaning that energy packages are, in effect, major expansions of the "internal market" ambitions.

7. DISCUSSION

The market liberal thinking dominated EU policymaking for decades (Talus, 2017); nevertheless, many scholars argue that the environmental energy ambitions of the European Union are incompatible with this school of thought (Aalto, 2014; Hammond and Jones, 2011; Helm, 2014). We find that EU policymakers are in a situation with little room for maneuver, environment being already at the top of the agenda.

The outcome of the research showed that, from a policy importance perspective, environment and internal energy market are the main policy priorities for EU policymakers, supporting Helm's (Helm, 2014) claims that the current EU energy design is based on the, presumably incompatible, internal energy market and the climate change package. Helm considers that this design is not tenable, and internal market must prevail. The findings seen so far (until 2018) show that internal market policies tend to have a higher trend of adoption than environment. In other words, the EU policymakers were choosing internal market over stronger environment measures, at least until 2018, heeding Helm's advice. This finding responds to several authors wondering about the direction of the EU policies (Dupont and Oberthür, 2012; Szulecki and Westphal, 2014).

This research did not find arguments to support market failures due to the intrinsic characteristics of the energy sector, as theorized by some authors (Foley and Lönnroth, 1981; Goldthau, 2012; Greening and Jefferson, 2013). The decades-long accelerating development of the internal market did not create additional market problems such as market failures or increasing market share of the largest generator in the electricity market (Eurostat, 2021). However, there is support resulting from this research for authors arguing that the energy sector has high externalities and internal market might be unable to solve them (Hammond and Jones,

2011). The argument for this conclusion is that despite numerous and major targets and objectives in the internal market domain, the environment priority needed hefty attention from policymakers to respond to the problems in that domain.

Substantial support is found by the results of this research for the supporters of liberalisation (Cambini and Rondi, 2010; Domah and Pollitt, 2001; Joskow, 2008; McGowan, 2008; Pollitt, 2012). Despite rather little attention towards affordability measures, the development of the internal market allowed major funding programs (e.g. the support for renewable energy sources, nuclear research) and higher prices for pollution (the EU Emissions Trading System, the National Emissions Ceiling Directive, the Industrial Emissions Directive), without an explosion in electricity prices.

8. CONCLUSIONS

The research question addressed is if there is an imbalance in EU electricity policies, what are its effects and how it reflects on the general discussion on liberalisation. The results of this investigation suggest that an imbalance indeed exists. The ranking of policy priorities, displaying a dominance of "environment" and "internal market," and only a few "security of supply" policies, show an imbalance of the energy trilemma for the European Union. We speculate that the solution for this conundrum would be more attention to EU security of supply and defusing in this manner potential tensions with member states. European treaties constantly reinforce European Commission's mandate in the environment area, but ringfence the energy independence of Member States. To be clear, this does not mean that the European institutions were banned from proposing European "security of supply" legislation. This grey area could be a reason for this imbalance in the classical energy trilemma for the European Union.

Going further into the investigation, the results show that EU energy policymaking is producing pioneering legislation (importance per target/objective) at a very stable rate, an almost flat line over the three decades studied. The average importance per each piece of legislation increases over time, but each legislation has also more objectives and targets. This means that pieces of legislation are more complex (with more targets and objectives), but not necessarily more radical (they provide almost the same number of pioneering provisions every year). This shows that the European institutions keep in fact a certain *couloir* of pioneering provisions. Meaningful change comes at a stagnating rate, despite increasing power for the EU institutions.

Looking at patterns through the pillars and categories classification, there are energy policies, such as "environment," given constant attention by policymakers, with pieces of legislation or targets/objectives adopted almost every year. However, a change of pattern occurs with "internal market," which has occasional occurrences in EU energy legislation adoption until 2003. From then on, the pattern changes and policymakers adopt every year, and in great numbers, targets and objectives on this energy priority. For example, the most important EU electricity-relevant binding pieces of legislation, totalling the most importance points per piece of legislation, are Regulation 714/2009 on conditions for access to the network for cross-border exchanges in electricity and Regulation 715/2009 on conditions for access to the natural gas transmission networks. Both are in the "internal market" domain. In the "environment" domain, the most important piece of legislation according to this article's methodology is Directive 88/609/EEC on the limitation of emissions of certain pollutants into the air from large combustion plants.

The charts resulted from mapping the energy policy field offer visual cues for energy packages identification. The precision of the perspectives deployed in this article (policy density, intensity and importance) was tested thereby and proved that the policy importance perspective was the most precise in recognising the adoption year of energy packages. Furthermore, correct identification of energy packages means that the policy importance analysis can be used to detect any future legislative package even if they are published or recognized by policymakers as a "package."

2016 was hypothesized as the adoption year for a new energy package, but this assumption was proved wrong. This leaves the question of why there is no energy package from 2009 to 2018. This is a clear change of pattern as previous packages appeared every 5–6 years. There is a jump in targets and objectives' importance in 2013; which could be interpreted as an unidentified energy package.

The imbalance in the energy trilemma is clear, but why is this happening? What drives the adoption of energy policy priorities in different years, different degrees of importance, different priorities? Scholarly literature exploration gives a plethora of responses, considering numerous factors as critical: from external factors, like price of raw energy materials (Schröder et al., 2013), technology (Alizadeh et al., 2016; Shilei and Yong, 2009; Zhu et al., 2015) and international relations (Taggart and Szczerbiak, 2013) to internal factors, such as policy implementation and adoption or even cultural factors specific to each member state (Falkner et al., 2007; Falkner and Treib, 2008). The empirical mapping that this article created allows such theories to be quantifiably checked, as there is enough body of data to act as control group and offer new insights of EU policy ambition and policymaking.

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