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A Systematic Review of Dutch Energy Policy Literature

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Abstract. With the increasing demands for energy, governance and policy aspects of energy are becoming ever more relevant. This paper¹ presents the results from a review of peer-reviewed journal articles on energy policy in the Netherlands. The research question for the systematic literature review is: *What are the main trends in international academic journal articles addressing politics, policy, and regulation in Dutch energy since the 1980s?* We analysed 158 peer reviewed journal articles that were published between 1982 and 2014. 89 codes were established to conduct a systematic literature review. Next to analysing raw and relatively frequencies of the codes, we also conducted a factor analysis to identify topics in which research mentioned in the literature can be clustered. The results show that papers tend to focus on a variety of different subjects: (1) policy- and governance studies on renewable energy or energy transition; (2) transition studies focusing on energy transition in sectors; (3) monitoring studies of energy efficiency programs in the built environment; (4) economic, quantitative studies on energy consumption, notably in industrious sectors; (5) simulation studies on policies and energy consumption; (6) quantitative comparative studies on energy consumption and climate change mitigation; (7) stakeholder analysis studies addressing renewable energy; and (8) studies addressing legitimacy of energy policy. Out of 158 only 42 can be classified as “policy/governance studies relevant” articles. The systematic review revealed that except for Transition Studies articles (using Transition Management or Technological Innovation Systems) there is hardly evidence of (systematic) use of policy relevant concepts and theory. Dutch energy policy, despite its societal and economic importance, seems to have been somewhat neglected by scholars of policy studies, governance and political science. The results of this study give leeway to a debate among scholars from these disciplines on how to develop a research agenda on policy, governance and political aspects of domestic energy systems.

Key words: *energy, policy, governance, literature review, The Netherlands.*

1. Introduction

Energy is one of the main drivers behind human development (Martínez & Ebenhack, 2008). Connecting energy use, economic growth and social growth, the United Nations’s Human Development Index (HDI) attempts to reflect the global human development. It shows that 75% of the world population has a significant energy consumption potential (Dias, Mattos, & P. Balestieri, 2006) With the globally increasing demands for energy, the policy aspects of energy are becoming ever more relevant.

Since the 1970s there has been a lot of attention by policymakers to domestic energy systems and their potential for transformative change (De Jong et al. 2005). In the Netherlands, based on the first law of thermodynamics, *Trias energetica*, the foci of governmental intervention

¹Acknowledgements: funded and facilitated by the University of Twente, this systematic literature review should be seen as a joint effort by the members of the Netherlands Institute of Governance (NIG) research colloquium “Energy and Climate Governance”. The results are presented in this conference paper at the 2014 NIG Annual Conference.

programs have been on reducing energy demand, replacing fossil with renewable energy sources, and using energy more efficiently. Although energy market intervention strategies in the country have received significant scholarly attention, interest from the academic fields of governance and policy studies to this domain seems low or rather absent. This is surprising given the importance of the energy domain in economies and society at large. At the same time we noticed that there is a substantial scholarly attention to the domain of energy policy from other disciplines; in particular Transition Studies and Economy.

The systematic literature review has its origins in meetings and joint publications by the NIG research colloquium “Energy and Climate Governance” (T. Hoppe, Bueren, & Sanders, 2013; T. Hoppe & Bueren, 2014). During a Nijmegen workshop organized in April 2014 the initiative was taken for conducting a literature review on Dutch energy policy. The review was deemed necessary to further insights on the state of the art of governance and policy research on energy issues, in particular regarding the academic disciplines of political science, governance (public administration) and policy studies. The results of the study were to be presented at the 2014 NIG annual work conference.²

The main research question for this study is: *What are the main trends in international academic journal articles addressing politics, policy, and regulation in Dutch energy since the 1980s?* In order to answer this question international academic studies of energy policy and energy governance in the Netherlands are reviewed systematically. The research goal is to further insights on how studies of energy policy and governance systems have been conducted, what their disciplinary backgrounds are, what the units of analysis are, which issues related to policy and governance have been addressed, and which (potential) relevant issues have been neglected. Moreover, we try to discover in which ways the role of government has been studied vis-à-vis energy systems, -markets, and sustainable transition. We selected the Netherlands as a case study for the systematic review because of the country’s dynamic, and diversified energy policy history, resulting in a relatively high quantity of academic literatures that can be subjected to systematic review. We used a single country focus as to avoid losing attention to the actual content of the literatures reviewed.³

In the following sections, we will address Methods (Section 2), Results (Section 3) and Discussion (Section 4). We conclude the paper in Section 5 where we also suggest how to further the research agenda on political, governance and policy aspects of energy policy research with the aim to encourage scholars of Governance, Policy Studies and Political Science to contribute to this research agenda.⁴

2. Methods

In this section we discuss data collection, data treatment and data analysis.

2.1 Data collection

Data collection for the systematic literature review was done through searching in relevant refereed international academic journal articles (in English) available through the online

²The research colloquium “Energy and Climate Governance” has established a fixed annual panel session at the NIG annual work conference.

³ Assuming the larger the amount of literatures under review is, the lesser attention there is for content.

⁴ We assume that scholars of Transition Studies do not need this encouragement since it seems that they are already heavily involved in this field.

Scopus database. Our selection criteria in searching the Scopus database were the presence of a combination of keywords covering the field of energy policy in the Netherlands (see Table 1). In analysing an article's focus, we checked for a range of keywords for each of the three subthemes (e.g. policy, policies, government, governance, implementation and regulation to cover "policy") in the article's title, abstract and keywords.

Table 1 *Keywords used for searching relevant journal articles*

| <i>Geographic scope</i> | <i>Discipline</i> | <i>Subject</i> |
|-------------------------|--|--|
| Netherlands Dutch | Policy Policies Government Governance Implementation Regulation | Energy (Climate change) mitigation |

We initially gathered 180 journal articles. However, following an in-depth check we excluded 22 as these articles did not qualify in matching our selection criteria (e.g. only using "policy" and "Netherlands" and not having "energy" in the title, abstract and keywords combination). After this second selection round a final dataset of 158 journal articles was established. An overview of these 158 journal articles is presented in Appendix 1.

In our data collection, surprisingly, we did not come across many papers including climate change mitigation. Parallel to the present systematic literature review on energy policy in the Netherlands, we also performed a data gathering project on *mitigation* policy in the Netherlands using the same methodology resulting in 32 journal articles. We need further analysis to be able to draw conclusions from this group of journal articles.

2.2 Data treatment

Data was coded using a coding scheme (Table 2). Key texts from journal articles (cf. titles, abstracts, key words) were coded based on a tentative list of ten clusters that consisted of twenty codes in total. These codes covered a wide range of characteristics of the article to allow us a thorough analysis as to identify phenomena and trends of academic interest.

Coding was an iterative process. New codes were added during the coding phase and these were also implemented "backwards" as we also checked how previous journal articles in the dataset "scored" on the newly added code. In the final stage of the coding, the code clusters each consisted of around ten codes resulting in a total of 89 codes. Some of the predefined codes proved to be irrelevant as we did not use them in the coding process. Table 2 presents an overview of all 89 codes that were used.

Table 2 *Code overview for analysing the database*

| <i>Cluster</i> | <i>Code</i> |
|--------------------------------|---|
| 1. Analytical level | International, National, Regional, Local, City, Rural. |
| 2. Policy relevance | Yes/no. |
| 3. Theoretical approach | Transition management, Innovation Systems, Eclectic model, Economic modelling, Multi-Level Perspective (transition studies), others. |
| 4. Methodological study design | (Policy) simulation, Qualitative (case study), Quantitative (survey, statistics), Comparative, Exploring of meanings (discourses, framing, etc.), Stakeholder analysis, Scenario analysis, Literature review, Monitoring/assessment, Modelling. |
| 5. Policy issue | Renewable energy (wind, biomass, hydro, etc.), Energy efficiency (saving), Climate change mitigation, Energy grids, Liberalization, European Union (Directives), Energy consumption, Energy transition/Transition management, Emissions (reduction), Waste (e.g. recycling), (Green) electricity, Shale gas, Carbon capture and storage (CCS), Legitimacy. |
| 6. Instrumental focus | Investments, Covenants/voluntary agreements, Subsidies (including feed-in tariff), Legal standards (regulation), (Green/white) Certificates, Indicators, Patents, Energy labelling/Energy performance, Cluster policy, Bench marking, Emission trading. |
| 7. Purpose of the study | Descriptive, Evaluative, Explorative, Normative, Design oriented, Public participation, Policy advice, Theoretical elaboration (hypothesis testing), Research agenda-setting. |
| 8. Results of the study | Differences in policy/implementation, Bioenergy/biofuel potential, Degree of energy savings (potential), Degree of monetary savings, Degree of CO ₂ /emissions reduction (potential), Adoption of innovation (no. of households or firms), Explanation for policy change, Advise pro or con policy/policy advise, Effectiveness of policies (instruments), Policy options. |
| 9. Sectoral focus | Agriculture/forestry/horticulture, Energy sector (gas, electricity), (Energy) research, Built environment, Industry/firms, Transport, Households/individuals, Government/public sector, ICT. |
| 10. Institute of author | University of Twente, Radboud University, TU Delft, TU Eindhoven, Utrecht University, Erasmus University, Wageningen University, VU Amsterdam, SPRU University of Sussex, Other university, Non-university research, Consultancy/firm/other. |

While some of the clusters allowed for conventional coding - as they allowed a binary value (present or absent) - other clusters needed a more interpretive approach of searching and analysing which code was best applicable (e.g. Instrumental focus, Methodological approach, Purpose of the study, Results of the Study or Theoretical Approach). We further found that the clusters of Purpose, Results and Theoretical Framework were generally absent or not clearly defined in the texts we analysed (title, abstracts and keywords). Often the information on these clusters had to be traced in the main body of the article. The theoretical approach in the journal articles, for instance, was rarely mentioned in the texts we analysed. We therefore also applied a quasi-inductive approach in which we reversely generated a list of theoretical perspectives by first going through each of the different journal articles and then drafting a codes list – hence we coded the “theoretical framework” cluster using a bottom-up approach. In Table 2 the results of this “reverse coding” are presented.

2.3 *Data analysis*

For analysing the code values we established a dataset using MS Excel. For further analysis part of the dataset was exported in order to allow for statistical analysis using SPSS. This resulted in a binary data matrix (with text files/journal articles in rows, and codes in columns). Data analysis consisted of descriptive statistics per coding cluster, in particular raw and relative frequencies. Creating a data matrix allows for further – more advanced – statistical analysis (and “data mining”).

Next to analysing raw and relatively frequencies of the codes used, we also conducted an explorative factor analysis to identify topics in which research mentioned in the literature can be clustered. The factor analysis included 23 items (see Appendix 2). The selection of items (from the 89 codes) concerned items that were selected for reasons of topical, theoretical or methodological interest, each item having at least 8 observations (journal articles). For the extraction method, Principal Component Analysis was used. Nine components with Eigenvector values larger than 1 were retrieved. Total (cumulative) explained variance of these nine components is 62.9 per cent.

3. **Results**

In this section the results of the systematic literature review are presented. The results concern key characteristics, general trends, topical frequencies, and identification of research clusters.

3.1 *Key characteristics of the sample*

Figure 1 shows how the scientific production of journal articles has evolved over time. We clearly observe a steep increase between the late 1990s and the 2010s, in particular between 2003 and 2010. More recently, this increase looks to have stabilised. We suspect that the peak in 2007-2010 (56 journal articles) is related to the intensifying research activities on Dutch energy policy by scholars from the Transition Studies disciplines, and by a (more general) research focus on renewable energy. The recent drop in the amount of journal articles focusing on energy policy is probably related to multiple reasons. However, for publications by Dutch authors it is not unlikely that the downward trend is related to decreasing second stream research funds. More in-depth research should shed light on a better grounded explanation on this.

The majority of academic journal articles retrieved via Scopus, has been published in the journal of *Energy Policy* (44 out of 158; which represents 28 per cent). In Table 3 the Top 7 of the most frequently used journals in which the journal articles that were retrieved, is presented. In total, the 158 journal articles have been published in 68 different journals. Most of these 68 journals, however, accounted for 1 article (43 journals) or 2 journal articles (11 journals). From Table 4 the impression is that *Energy Policy* is the key academic journal in which journal articles on energy policy in the Netherlands have been published.

Figure 1 Year of publication (in three year intervals)

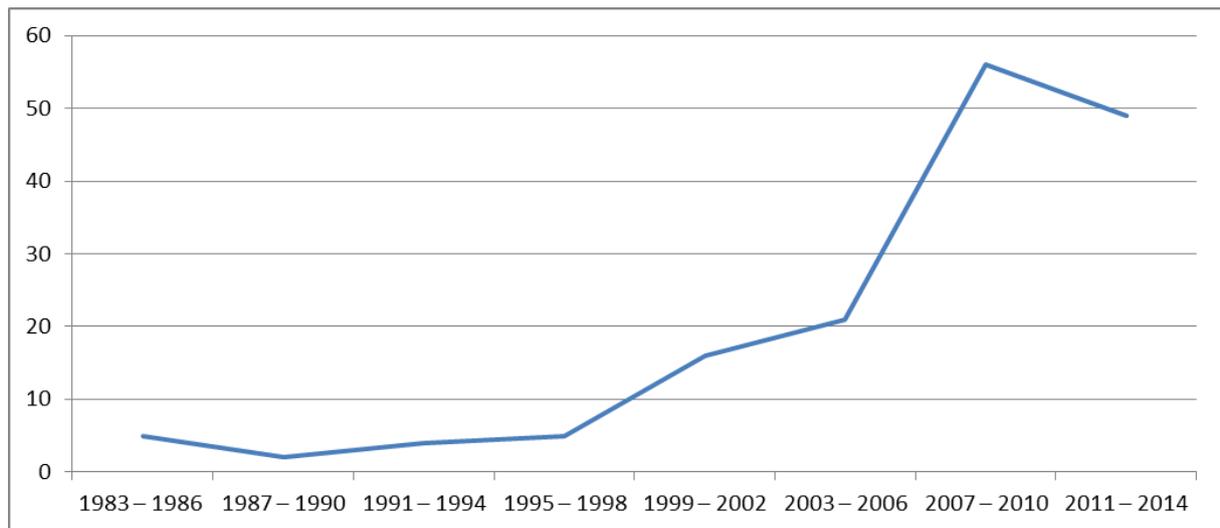


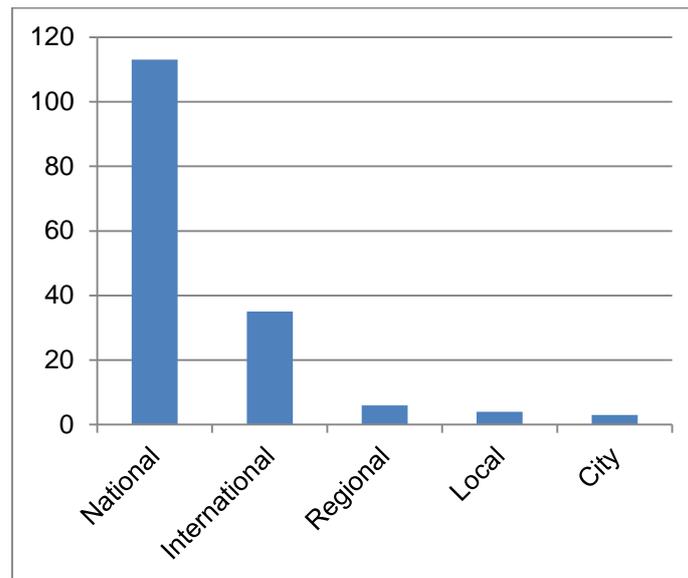
Table 3 Academic journals in which was published most frequently

| <i>Academic journal</i> | <i>Number of journal articles</i> |
|---|-----------------------------------|
| Energy Policy | 44 |
| Biomass and Bioenergy | 6 |
| Journal of Cleaner Production | 6 |
| Ecological Economics | 4 |
| Energy | 4 |
| Energy Economics | 4 |
| International Journal of Greenhouse Gas Control | 4 |

3.2 Analytical level

We used “international”, “national”, “regional”, “local”, “city” and “rural” as codes within the cluster regarding analytical level. As journal articles selection was based on mentioning of three keywords including “the Netherlands” and “Dutch”, this obviously resulted in a large majority of papers focusing on the Netherlands (hence national level). Approximately 20 per cent of the journal articles reviewed, the Netherlands is part of a comparative analysis, and is hence compared to other (European) countries. Figure 2 clearly shows the low amount of studies focusing at regional and local levels.

Figure 2 *Overview of the analytical levels*



3.3 Relevance to the disciplines of Governance, Policy Studies or Political Science

Of 158 journal articles in total, we identified 42 (27 per cent) as “policy/governance studies relevant”. A journal article was considered “policy relevant” when the contribution explicitly addressed the role of government, governance or government policies. More in the general, attributing this code to an article was deemed appropriate when the article could be viewed as contributing to ongoing debates in the academic disciplines of governance, policy studies or political science. In some cases the (disciplinary) boundary was not entirely clear, and therefore we decided to code a few Transition Management articles as “policy relevant” as well (given the way government, governance and government policy are emphasized in these articles).

Having identified 42 articles as “policy/governance studies relevant”, this means that 116 journal articles (73 per cent) are viewed by us as studies that have disciplinary background that differ from political science, public administration or policy studies.

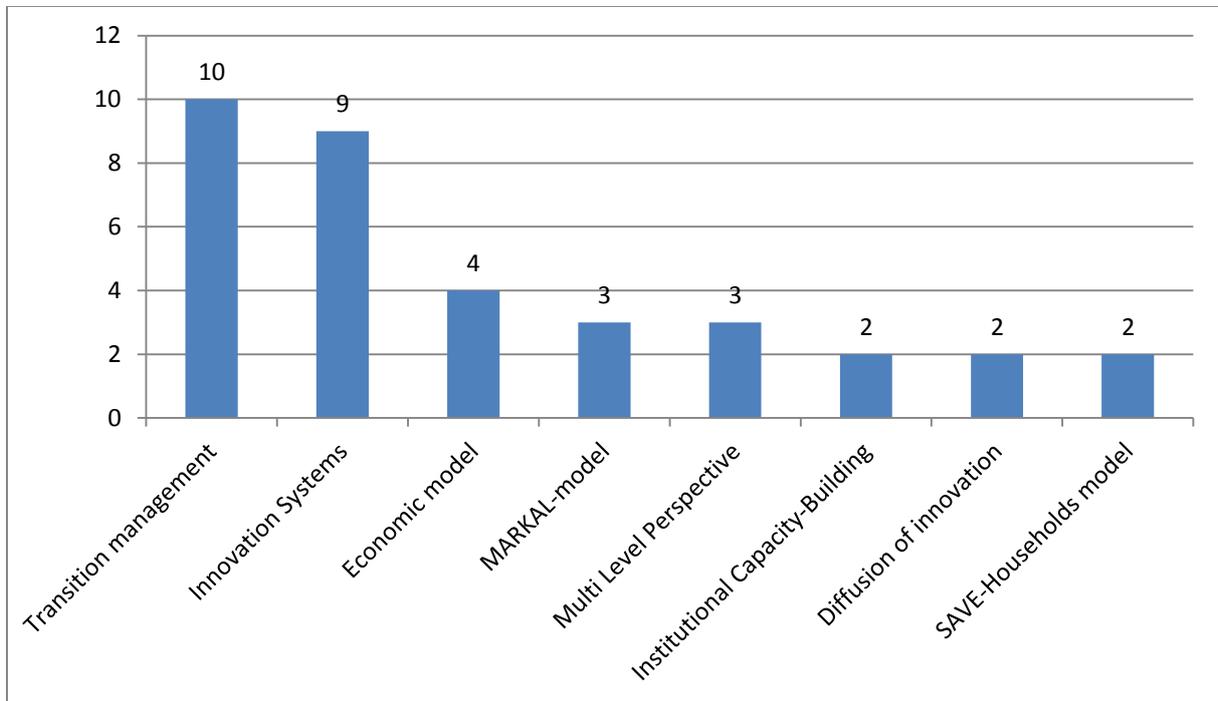
3.4 Theoretical perspectives used

In 50 journal articles (32 per cent of the total population) no clear theoretical frameworks were used. In addition to the “no framework” category, we further found that for another group of 15 journal articles (10 per cent) is either unclear whether theoretical perspectives were used. The most frequent used theoretical perspectives were: Transition Management (10 counts; 6 per cent of the total population) and Innovation Systems (nine counts; six per cent). Both should be seen as theoretical frameworks from the discipline of Transition Studies. Commonly used theoretical frameworks in policy studies or public administrations such as the Advocacy Coalition Framework (Sabatier), Institutional Analysis Design Framework (Ostrom) or Punctuated Equilibrium were not observed.⁵ We found that economic studies applied a wide variety of (often eclectic) models. All in all, except for the Transition Studies frameworks (Transition Management, Innovation Systems, Multilevel Perspective, Strategic Niche Management) few theoretical frameworks were used more than once. This observation

⁵ In addition, political science and legal sciences were hardly observed at all among the articles in the dataset.

is important as it suggests a potential lack of theoretical elaboration on energy policy and governance, when looking to the disciplinary field of policy studies and public administration.

Figure 3 *Overview of theoretical approaches*



3.5 *Research designs used*

This cluster of codes covers the research design of studies that were reviewed. Ten different types of research design were retrieved (see Table 2). Qualitative research designs⁶ were used in 73 studies (47 per cent of the total population), whereas (economic) modelling (43 counts; 28 per cent of the total population) and scenario analysis (30 counts; 19 per cent of the total population) were often used as well.⁷ We also retrieved no less than 29 journal articles in which comparative research designs were used (studies comparing multiple European countries, including the Netherlands). In 20 journal articles policies or policy instruments were assessed on the effects they generated. Some of those journal articles presented results from policy evaluations (e.g. Murphy, Meijer, & Visscher, 2012).

3.6 *Topical foci used*

Thirteen policy issues were established on which the 158 studies have focused (see Figure 5). These issues range from renewable energy, decentralisation, liberalisation, waste, shale gas, to carbon capture and storage (see Table 2). Most frequently observed topical issues were energy efficiency (55 counts; 35 per cent of the total population), renewable energy (42 counts; 27 per cent) and energy transition (30 counts; 19 per cent). Climate change mitigation was only covered by 10 journal articles.

⁶ Qualitative research is generally understood as case study research designs. This category for example includes historical reconstruction of particular policy processes.

⁷ Some journal articles used multiple research designs.

Figure 4 *Overview of research designs*

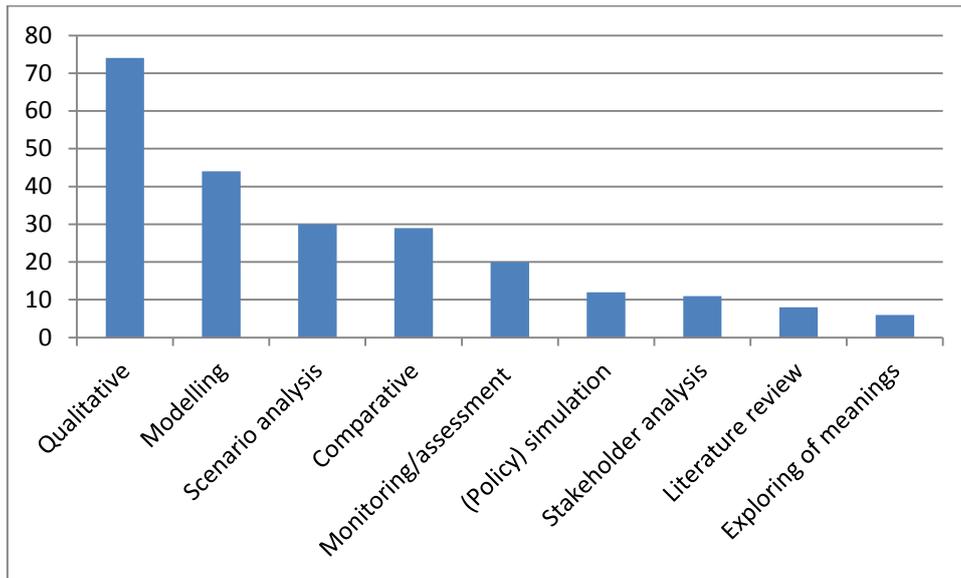
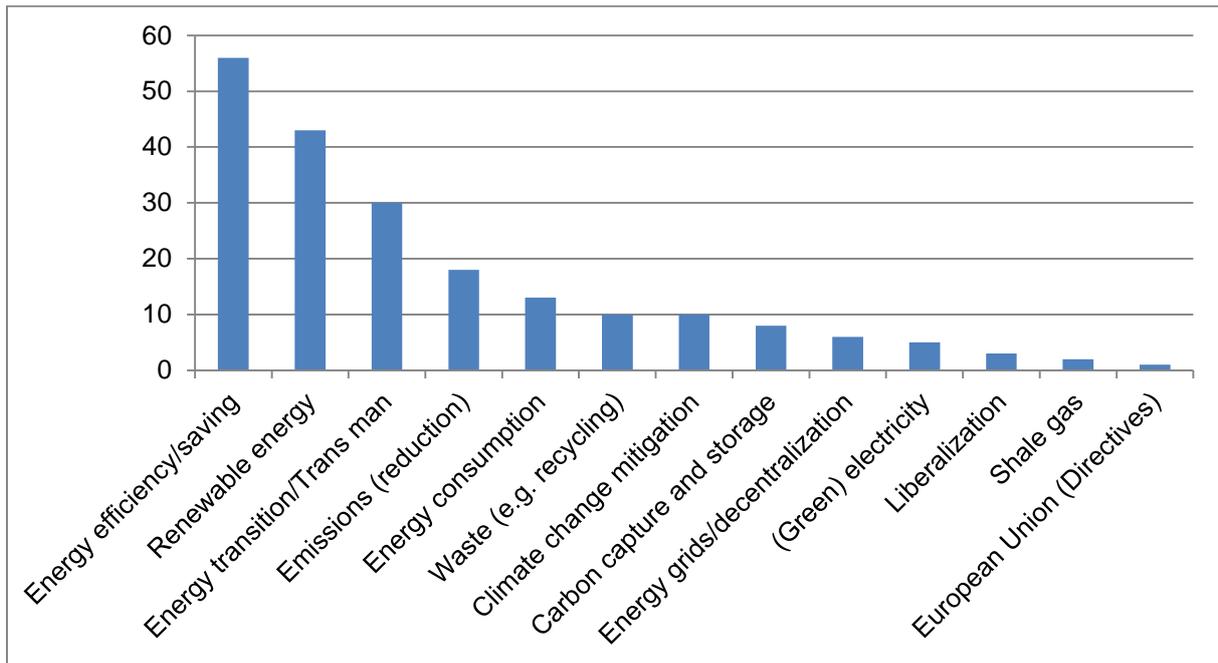


Figure 5 *Overview of topical foci*

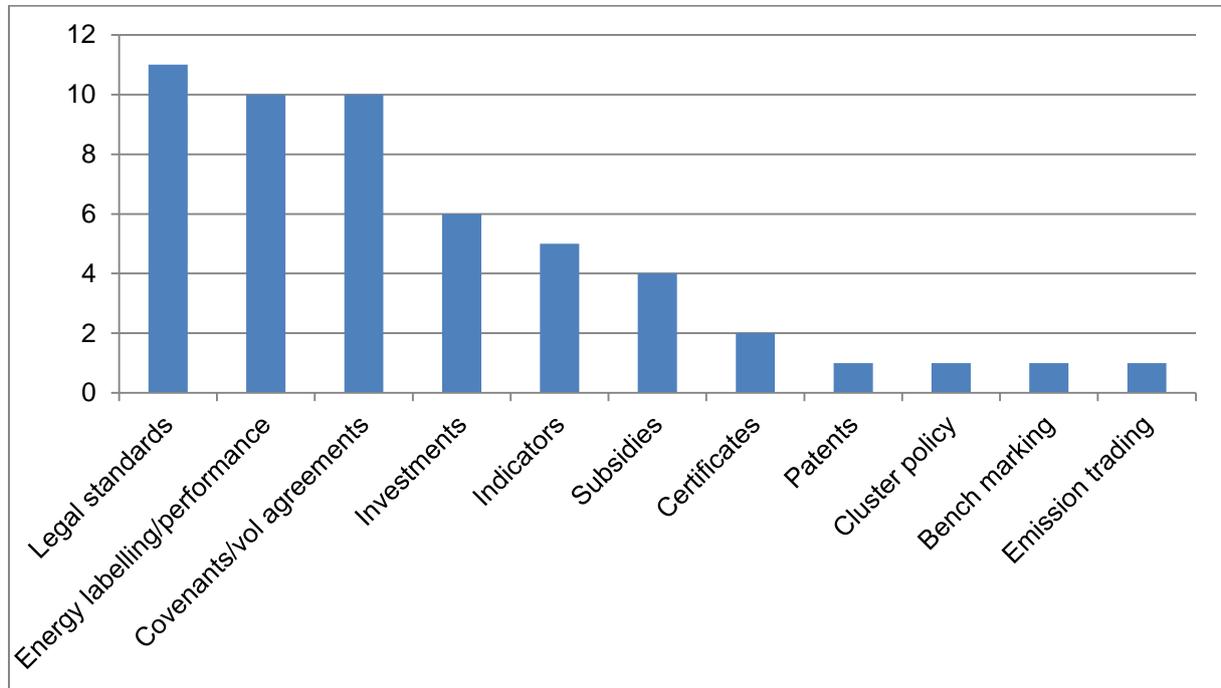


3.7 *Instrumental foci used*

In 42 journal articles the role or impact of policy instruments was addressed. The policy instrument most frequently addressed in the reviewed journal articles was legal standards - or regulation more in general – with eleven counts (seven per cent of the total population). Second are both covenants/voluntary agreements and energy labelling. Each of the two instruments categories had been addressed in 10 journal articles (covers about six per cent of total journal articles reviewed). In the majority of the 158 journal articles (116 which

resembles 73 per cent) no policy instruments were mentioned. On the other hand we also retrieved journal articles in which multiple policy instrument were mentioned.

Figure 6 *Overview of instrumental foci*



3.8 Purpose of the articles

The purpose of the study ranged from evaluative, advisory, exploratory, (research) agenda setting to theoretical elaboration⁸ (see Figure 7). The category most frequently mentioned was explorative studies (84 counts; 54 per cent of the total population). Evaluation studies (49 counts; 31 per cent) and descriptive studies (29 counts; 18 per cent) were also observed in frequent fashion. Theoretical elaboration studies were hardly observed (4 counts).

3.9 Outcome indicators

As to cover the outcomes of the journal articles, we differenced ten codes to cover “Results of the study (see Figure 8). In most journal articles, its outcomes relate to policy making; e.g. many cases are finalized mentioning advices for potential adoption in policy making. Most frequent observed classification of results concern the effectiveness of (a given) policy (51 counts; 32 per cent), attempts to explain the differences in the implementation of a policy issue in a certain context (e.g. regional or national levels) (41 counts; 26 per cent), or the advice con or pro a particular policy (37 counts; 11 per cent). In the case of the differences in implementation, this was typically done using a comparative research design.

⁸ We understood *explorative* as studies that aimed at investigating the topic of study in practice without predefining a framework or theoretical approach. Instead, the studies aimed at finding out how the issues is being implemented “in the field”. *Evaluative* is understood as studies which investigate whether a predefined norm or goal or ambition (e.g. in policy) was realised in practice. This is assessed after the goal has been set and implemented. Descriptive studies are aiming at merely describing a case which usually is a development or process over time. The initial goal of descriptive papers is that describing or reconstructing a case leads to its understanding.

Figure 7 *Overview of the purpose of articles*

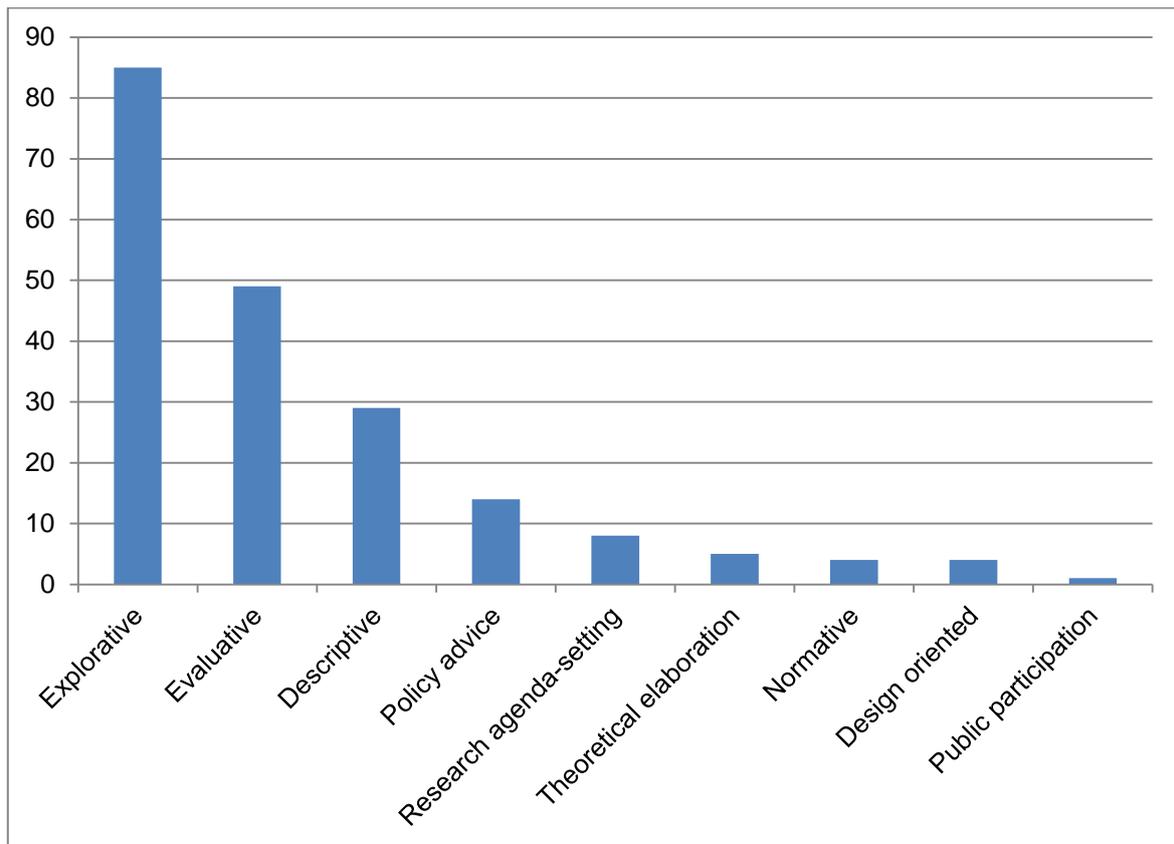
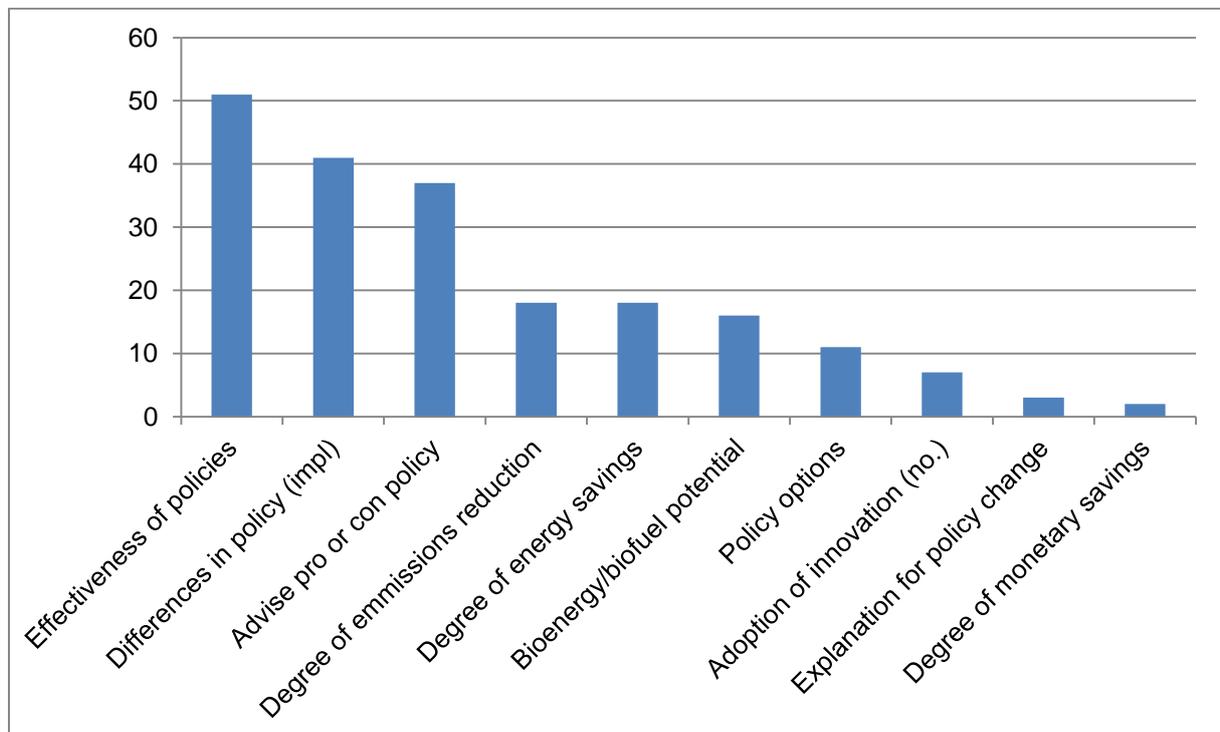


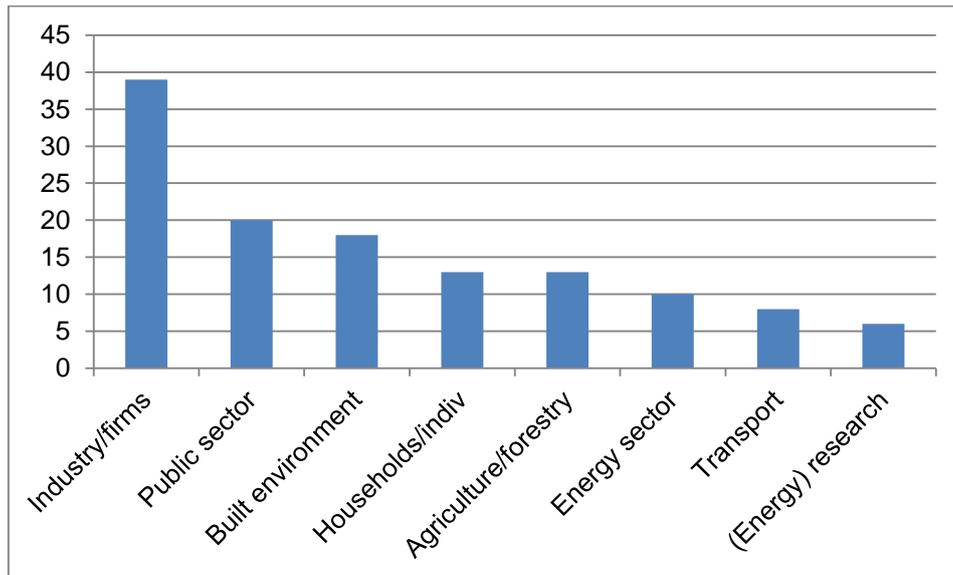
Figure 8 *Overview of the outcome indicators*



3.10 Sectoral foci used

We further discerned the sector where the studies focused upon. We defined economic sectors (e.g. agriculture, energy, transport), but also households (this also included the individual level) and the public sector or “government” (see Table 2). The journal articles mostly focused on industry which also included firms at mesa level (39 counts; 25 per cent of the total population), the public sector (20 counts; 13 per cent) and the built environment (17 counts; 11 per cent). Households (13 counts) however, can also be accounted to the built environment (hence, built environment accumulates to 30 counts or 19 per cent of the total population).

Figure 9 Overview of sectoral foci

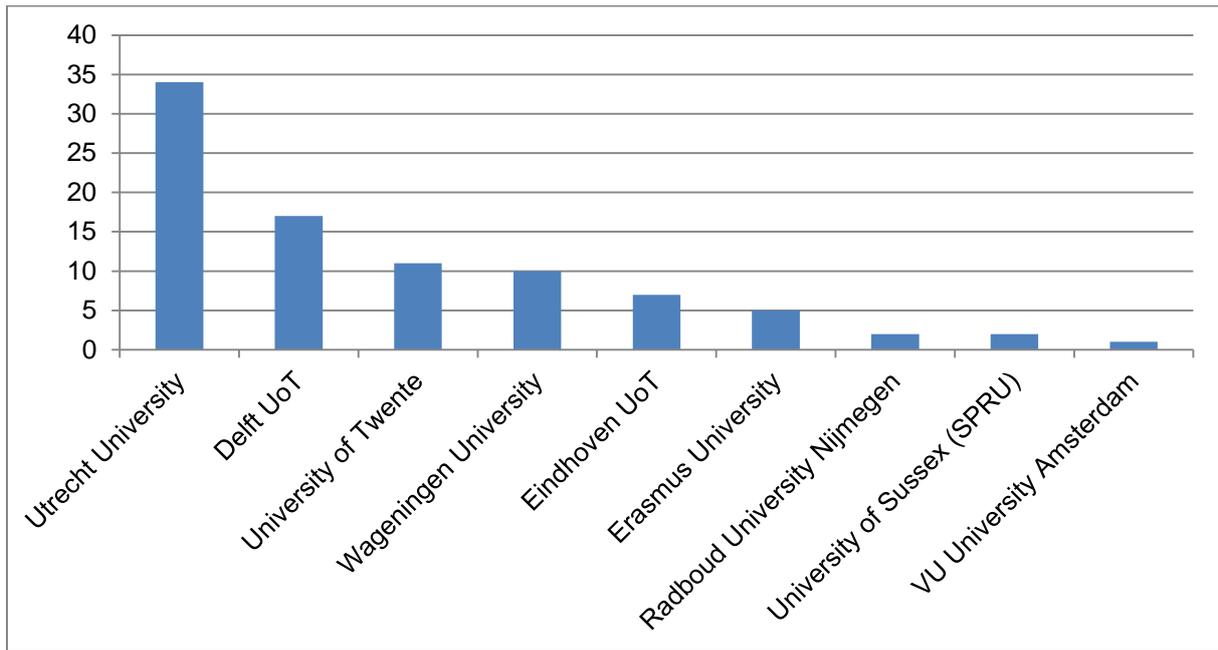


3.11 Affiliation of authors

This cluster covers the affiliation of the first author at the time of publication (See Figure 10 for an overview). The largest ‘producer’ of papers in our selection proved to be the Utrecht University adding 34 journal articles (21 per cent). Second is the group on “non-university research” which includes private and public research institutes like the Dutch National Institute for Public Health and the Environment (RIVM). The second institute adding 17 journal articles to the total of the papers (around eleven per cent) is the Delft University of Technology. The University of Twente is the third institute adding 11 journal articles (seven per cent) to the total of papers. We also analysed frequencies of first authors. Some authors appear as first author of as many as four papers (e.g. Agterbosch).

In addition to these institutes, we found another 32 articles produced by “other universities” from around the world. This category included all universities except for the ones

Figure 10 Overview of the first author's affiliation



3.12 Results of the factor analysis

Nine components resulted from the factor analysis (see Appendix 2). Table 5 presents an overview of the nine components the way we perceive them as research clusters vis-à-vis Dutch energy policy. Components 5 and 9 resemble each other to a large extent.

Table 5 Research clusters resulting from the factor analysis

| <i>Component</i> | <i>Meaning of cluster</i> |
|------------------|---|
| 1 | Policy studies focusing on the role of government in energy transition and renewable energy domains. The research design is typically case studies. |
| 2 | Transition studies that focus on monitoring of energy sector transition policies and future energy sector scenarios. |
| 3 | Studies focusing on monitoring of energy efficiency programs and (related) programs in the built environment. |
| 4 | Economic, quantitative studies on energy consumption, notably in industrious sectors. |
| 5 | Policy simulation models on energy consumption in the energy sector or built environment. |
| 6 | Quantitative comparative studies (of EU countries) on energy consumption and climate change mitigation (greenhouse gas emissions reduction). |
| 7 | Studies focusing on renewable energy using stakeholder analysis |
| 8 | Studies on legitimacy (of energy policy). |
| 9 | Policy simulations on energy consumption and greenhouse gas emission in industrious economic sectors. |

Next to these groups, in-depth content-wise analysis of the articles shows that there might be more clusters that are of interest

Arguably, there is an additional cluster of articles addressing the diffusion of energy innovations adding a layer on top on the studies on the feasibility of a particular technology by explaining how technology spreads throughout society. Several papers go into this topic by analysing how energy saving techniques are being adopted (Dieperink, Brand, & Vermeulen, 2004; T. Hoppe, Bressers, & Lulofs, 2011; Noailly & Batrakova, 2010; Raven & Verbong, 2009).

Another potential cluster is formed by a group of ten journal articles focusing on energy policy in relation to climate change challenges (Azevedo, Delarue, & Meeus, 2013; Damen, Faaij, & Turkenburg, 2009; R. Hoppe & Wesselink, 2014; T. Hoppe et al., 2011; T. Hoppe, van den Berg, & Coenen, 2014; Konidari & Mavrakis, 2007; Schenk, Moll, Potting, & Benders, 2007; Swart & Kok, 1988; Tambach & Visscher, 2012; van den Broek, Veenendaal, Koutstaal, Turkenburg, & Faaij, 2011).

4 Discussion

In this paper, we have reviewed a selection of papers on the theme “energy policy in the Netherlands”. In this section, we will discuss the results.

The systematic review revealed that - except for Transition Studies articles (using Transition Management or Technological Innovation Systems; Kern, 2012 has provided a review of TM literature particularly focusing on TM implementation in the Dutch energy domain) - there is hardly evidence of (systematic) use of policy relevant concepts and theory. Commonly used theoretical concepts to understand governance and policy phenomena were hardly found in literatures on Dutch energy policy (e.g. PPPs, multilevel governance, co-production, legitimacy and legal aspects of energy policy). Other commonly used concepts in governance and policy studies - like ‘policy networks’ - are used, but in an indirect way: they are incorporated in eclectic models, and hence do not allow for any systematic conceptual elaboration. Dutch energy policy, despite its societal and economic importance seems neglected by scholars of governance and policy studies. Rather scholars from other disciplines, notably Transition Studies, have ‘borrowed’ and incorporated governance and policy studies concepts into their respective disciplinary theoretical frameworks and used those to analyse Dutch energy policy case studies.

Moreover, few journal articles address how and why policy instruments work as a means to influence (elements of) the energy sector (e.g. Azevedo, Delarue, & Meeus, 2013). Instead, most of the journal articles we defined as “policy relevant” typically address differences of (policy) implementation, and the adoption of new technologies. In addition, few journal articles attempt to elaborate existing theoretical concepts. Instead, eclectic, standalone research concepts (be they research models, perspectives or frameworks) are used. In the case of journal articles that do apply a deductive approach by going into multilevel governance or the diffusion of innovations, we often experienced difficulties retrieving the theoretical backgrounds of theoretical concepts used in the articles.

In summary, the results conform the claim that formed the outset of this paper: the disciplines of governance, policy studies and political science seem to have rather neglected the issue of Dutch energy policy. The field rather receives attention from scholars who conduct studies using a variety of economic and (quantitative) scenario studies which can serve as a basis for policy advice, or use transition research frameworks. Empirical research into design and implementation of energy policies in the Netherlands is the domain of economists and scholars of Transition Studies. Moreover, the literature seems to be biased towards macro level analysis, and tends to neglect the regional and local level.

5. Conclusion

In this systematic literature review, a dataset of 158 international refereed academic journal articles was analysed to identify key academic and policy trends addressing politics, policy,

and regulation in light of fostering transitional change in the Dutch energy system since the 1980s. 42 of those were classified relevant to the disciplinary fields of policy studies and governance.

The results presented eight different clusters with a focus on a variety of different subjects: (1) policy- and governance studies on renewable energy or energy transition; (2) transition studies focusing on energy transition in sectors; (3) monitoring studies of energy efficiency programs in the built environment; (4) economic, quantitative studies on energy consumption, notably in industrious sectors; (5) simulation studies on policies and energy consumption; (6) quantitative comparative studies on energy consumption and climate change mitigation; (7) stakeholder analysis studies addressing renewable energy; and (8) studies addressing legitimacy of energy policy. Arguably, clusters on (i) diffusion of energy innovations, and (ii) energy policy vis-à-vis climate change mitigation can be added to the list of clusters.

Moreover, the results conform the claim that formed the outset of this paper: the disciplines of governance, policy studies and political science seem to have neglected the issue of Dutch energy policy. The field is characterized by a wide variety of economic and (quantitative) scenario studies, which can serve as a basis for policy advice. Empirical research into design and implementation of energy policies in the Netherlands looks like it is the domain of economists and scholars of Transition Studies. Moreover, the literature seems to be biased towards macro level analysis, and tends to neglect regional and local level (implementation of policies). We also found that the current scientific body of knowledge on Dutch energy policy shows a rather diffuse picture in which there is limited unity in terms of empirical and theoretical approaches. The results give leeway to a debate among scholars of energy policy on how an agenda for future research on political and policy aspects of domestic energy systems can be created.

Given the results of the analysis it can be argued that more scholarly attention to the domain of (Dutch) energy policy is needed from the academic disciplines of governance, policy studies and political science. Given the grand societal challenges the energy sector is facing, the extent to which energy markets are regulated, and the emphasis that lies with energy policies and policies to spur transitional change in energy systems, it is remarkable that scholarly attention from these disciplines has been limited thus far.

The results of the systematic literature review show that some substantial policy and governance concepts have not been covered, or have only been covered to a very limited extent. Therefore we would like to encourage scholars of policy studies and governance to address one or more of the following concepts in future research on (Dutch) energy policy:

- Policy making of energy vis-à-vis climate change mitigation⁹ policies;
- The roles of discourse and advocacy coalitions;
- Governance systems;
- Multilevel governance;
- Regional governance;
- Local and city governance;

⁹ A special issue on governance of climate change mitigation issues was published in 2013 (Hoppe, Van Bueren & Sanders, 2013). However, it was published in the Dutch academic journal 'Bestuurswetenschappen' which uses the Dutch language. Given this reason, articles from this special issue were not included in the dataset that was used for conducting the systematic literature review of Dutch energy policy.

- Legal (normative) aspects of energy (transition) policy;
- Coproduction and public participation;
- Public-private partnerships;
- Policy implementation and effectiveness studies of policy instruments;
- Policy networks;
- Quantitative hypothesis research designs;
- Design-oriented governance studies;
- Policy studies on the impact of climate change mitigation policy;
- Policy studies on the impact of liberalization of the (Dutch) energy sector.

Although some of the above mentioned concepts have, in fact, been used in Transition Studies frameworks (in particular in studies using Transition Management) we feel that use and elaboration of these concept in a more disciplinary – governance or policy studies - way needs attention as well. Whereas as Transition Studies approaches are “transition-driven” and the use of the above mentioned concepts reflects a “borrow-and-incorporation” of governance and policy studies concepts logic, we feel a desire to also use and apply conceptually and disciplinary driven approaches, and test and elaborate these concepts in the energy domain in more policy and governance driven ways. We feel that such a process could very well start by analysing the 42 articles we coded as relevant to policy studies and governance in-depth.

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APPENDIX I *Overview of the reviewed literature*

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APPENDIX 2 *Results of the factor analysis*

| Component | Total Variance Explained | | | | |
|-----------|--------------------------|---------------|--------------|-------------------------------------|---------------|
| | Initial Eigenvalues | | | Extraction Sums of Squared Loadings | |
| | Total | % of Variance | Cumulative % | Total | % of Variance |
| 1 | 2,580 | 11,217 | 11,217 | 2,580 | 11,217 |
| 2 | 2,010 | 8,738 | 19,955 | 2,010 | 8,738 |
| 3 | 1,940 | 8,433 | 28,388 | 1,940 | 8,433 |
| 4 | 1,695 | 7,369 | 35,757 | 1,695 | 7,369 |
| 5 | 1,387 | 6,032 | 41,789 | 1,387 | 6,032 |
| 6 | 1,342 | 5,834 | 47,623 | 1,342 | 5,834 |
| 7 | 1,300 | 5,651 | 53,275 | 1,300 | 5,651 |
| 8 | 1,139 | 4,954 | 58,228 | 1,139 | 4,954 |
| 9 | 1,078 | 4,688 | 62,916 | 1,078 | 4,688 |
| 10 | ,983 | 4,273 | 67,189 | | |
| 11 | ,930 | 4,043 | 71,232 | | |
| 12 | ,887 | 3,857 | 75,089 | | |
| 13 | ,795 | 3,458 | 78,546 | | |
| 14 | ,746 | 3,245 | 81,792 | | |
| 15 | ,719 | 3,126 | 84,918 | | |
| 16 | ,653 | 2,837 | 87,755 | | |
| 17 | ,545 | 2,371 | 90,125 | | |
| 18 | ,521 | 2,264 | 92,390 | | |
| 19 | ,458 | 1,992 | 94,382 | | |
| 20 | ,416 | 1,807 | 96,189 | | |
| 21 | ,330 | 1,434 | 97,623 | | |
| 22 | ,282 | 1,228 | 98,851 | | |
| 23 | ,264 | 1,149 | 100,000 | | |

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Component Matrix^a

| | Component | | | | | |
|-------------------------|-----------|-------|-------|-------|-------|-------|
| | 1 | 2 | 3 | 4 | 5 | 6 |
| PolicyStudies | ,386 | -,515 | -,092 | -,078 | ,218 | ,082 |
| TransitionStudies | ,300 | ,570 | ,446 | ,111 | -,098 | ,025 |
| Economy | -,389 | ,228 | -,254 | ,384 | ,054 | ,152 |
| PolicySimulation | -,318 | ,311 | ,093 | -,303 | ,325 | ,194 |
| CaseStudy | ,684 | -,082 | -,138 | ,003 | ,219 | -,202 |
| Quant | -,343 | -,201 | ,145 | ,490 | -,058 | ,376 |
| Comparative | ,167 | -,264 | -,416 | ,140 | -,284 | ,341 |
| StakeholderAnalysis | ,182 | ,148 | ,186 | ,023 | ,064 | -,050 |
| Scenario | -,377 | ,283 | ,025 | -,376 | ,147 | ,049 |
| Monitoring | ,110 | ,304 | ,516 | ,308 | -,222 | -,007 |
| Modelling | -,578 | ,238 | -,103 | -,460 | -,129 | ,002 |
| RenewableEnergy | ,271 | ,157 | -,567 | ,111 | -,162 | -,159 |
| EnergyEfficiency | -,355 | -,433 | ,451 | ,040 | ,056 | -,173 |
| ClimateChangeMitigation | -,018 | -,278 | ,151 | -,331 | -,336 | ,376 |
| EnergyConsumption | -,211 | ,159 | ,197 | ,481 | ,210 | ,341 |
| EnergyTransition | ,507 | ,344 | ,226 | -,244 | ,088 | ,156 |
| Emissions | -,212 | ,017 | ,156 | -,254 | ,114 | -,382 |
| Legitimacy | ,155 | ,003 | ,028 | ,106 | ,213 | -,219 |
| Agriculture | -,265 | ,175 | -,485 | -,118 | -,105 | ,099 |
| EnergySector | ,207 | ,340 | -,207 | ,184 | ,533 | ,155 |
| BuiltEnvironment | -,113 | -,565 | ,309 | -,046 | ,365 | ,035 |
| Industry | -,132 | ,057 | ,114 | ,297 | -,451 | -,510 |
| Government | ,491 | ,023 | ,290 | -,316 | -,340 | ,379 |

Component Matrix^a

| | Component | | |
|-------------------------|-----------|-------|-------|
| | 7 | 8 | 9 |
| PolicyStudies | ,137 | -,054 | ,348 |
| TransitionStudies | ,092 | ,066 | -,045 |
| Economy | -,278 | -,033 | ,170 |
| PolicySimulation | ,152 | ,090 | ,476 |
| CaseStudy | -,306 | ,036 | -,089 |
| Quant | ,154 | ,292 | -,123 |
| Comparative | ,206 | -,173 | -,040 |
| StakeholderAnalysis | ,685 | -,271 | ,328 |
| Scenario | ,254 | ,124 | -,249 |
| Monitoring | ,132 | ,002 | -,111 |
| Modelling | -,137 | ,146 | -,084 |
| RenewableEnergy | ,314 | ,156 | -,163 |
| EnergyEfficiency | ,071 | ,087 | ,140 |
| ClimateChangeMitigation | -,212 | ,062 | ,228 |
| EnergyConsumption | -,233 | -,256 | -,067 |
| EnergyTransition | ,080 | ,095 | -,164 |
| Emissions | -,230 | -,478 | -,080 |
| Legitimacy | -,118 | ,730 | ,140 |
| Agriculture | ,144 | ,082 | ,130 |
| EnergySector | -,185 | -,054 | ,240 |
| BuiltEnvironment | ,180 | ,099 | -,243 |
| Industry | -,075 | ,058 | ,417 |
| Government | -,271 | ,052 | ,149 |

Extraction Method: Principal Component Analysis.^a

a. 9 components extracted.