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Towards ecological governance in EU energy law

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Chapter One

Introduction



1.1. Environmental degradation, societal change and the role of law

Climate change is a reality we need to address.¹ Despite various solemn pledges and many initiatives,² global emissions are still rising and environmental degradation and pollution pertain.³ The science on the main cause of climate change, human induced greenhouse gas (GHG) emissions, is sufficiently clear and conclusive, and international consensus has been achieved on to the need for humankind to act fast and drastically.⁴ However, our responses are in practice slow and insufficient.⁵ Various reasons can be given for this.⁶ One of them is that it took time to come to understand and, in particular, to accept that climate change and the progressive degradation of ecosystems are indeed largely caused by human activities. By now, scientific acceptance has been achieved, but political acceptance is lagging behind and hardly goes beyond mere window dressing.⁷ The challenge appears to be too large to confront and the consequences for our societal structures too far-reaching, since addressing the core of the problem would have profound implications for all policy areas. Our energy systems in particular would be affected, as the energy sector is responsible for around two-thirds of all global anthropogenic emissions.⁸ For this reason, the regulation of the energy sector is one of the anchor points of this dissertation, as will be addressed in more detail in paragraph 1.2.6. Adequate responses to climate change are further hindered by the fact that the processes behind climate change as well as the functioning of ecosystems themselves are characterised by interdependency and non-linearity, which makes

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- 1 Climate change is one of the nine tightly coupled planetary boundaries that define the safe operating space for humanity with respect to the Earth system. See J. Rockström *et al*, 'A safe operating space for humanity' (2009) 461 *Nature* 472–475 doi:10.1038/461472a.
 - 2 In particular the 'Paris Agreement under the United Nations Framework Convention on Climate Change' Decision 1/CP.21 of 12 December 2015 (Paris Climate Treaty).
 - 3 United Nations, 'IPCC: Greenhouse gas emissions accelerate despite reduction efforts—many pathways to substantial emissions reductions are available' April 2014, <http://www.un.org/climatechange/blog/2014/04/ipcc-greenhouse-gas-emissions-accelerate-despite-reduction-efforts-many-pathways-to-substantial-emissions-reductions-are-available/>; International Energy Agency (IEA), *World Energy Outlook 2015* (IEA 2015a); IEA, *Energy and Climate Change. World Energy Outlook Special Report* (IEA 2015b).
 - 4 See *inter alia* Intergovernmental Panel on Climate Change (IPCC), *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* (IPCC 2014), e.g. *Summary for Policymakers*, https://www.ipcc.ch/pdf/assessment-report/ar5/syr/AR5_SYR_FINAL_SPM.pdf, 2; and Paris Climate Treaty (n 2) and subsequent COP meetings.
 - 5 The discrepancy between the level of emissions that we have and the level we should have is called 'the emissions gap'. See United Nations Environment Programme (UNEP), *The Emissions Gap Report 2016: A UNEP Synthesis Report* (UNEP November 2016) <http://capacity4dev.ec.europa.eu/unep/document/emissions-gap-report-2016-unep-synthesis-report>, at p. xvii.
 - 6 I do not intend or pretend to give a full explanation here.
 - 7 'Acceptance' is used here in the sense that awareness and acknowledgement are coupled with adequate responses to deal with the situation.
 - 8 IEA 2015b (n 3) at p. 20. Therefore, regulation of the energy sector is one of the anchor points of this thesis, as will be addressed in more detail in paragraph.

them complex and therefore difficult to comprehend. As a result, our existing societal and legal structures are inadequate to deal with the problems humankind currently faces.

It is therefore time to rethink these structures to come to an approach that sufficiently acknowledges the complexities at hand. To address the challenges we face, we need to reconsider how we travel, build, eat, manufacture and so on; in short: how we live and how we organise our societies. This overhaul is a massive task that will affect all aspects of society and requires change at all levels. One of these changes will have to be to amend our legal structures in order for them to reflect, and do justice to, the complexities of ecosystems. Throughout this dissertation, I argue that not only should our legal systems acknowledge the interdependent, myriad relationships between the constituent components of ecosystems, they should also expressly acknowledge the fact that humankind is an integrated part of these ecosystems and fully dependent thereon.

Thus, essentially, the basic thought underlying this research is that we need to develop a more life-cycle oriented, or holistic, approach in how we regulate our (damaging) activities.⁹ We need to take into consideration all the (cumulative) effects that these activities have on our environment and it is presumed that we are under a duty to minimise the negative effects of such activities, even if these effects are remote, diffuse or complex. Translating these notions into research questions and making them suitable as a dissertation topic, clearly required further demarcation and specification of the terminology used.

1.2. Theoretical foundations and terminology

1.2.1. Sustainable development

I started off from the concept of sustainable development as it is currently deployed to make the transition to a sustainable society. The common definition used is the one from the Brundtland report which describes sustainable development as ‘development that meets the needs of the present without compromising the ability of future generations to meet their own needs’.¹⁰ To achieve this goal, environmental, economic and social interests must be weighed and balanced in decision making. Soon, however, I realised that the concept in its current form cannot bring about the envisaged holistic approach for at least two reasons.

First, the concept provides (some) guidance on which aspects to consider in the decision-making process, but it provides no guidance on the direction of the outcome of this process.¹¹ Thus, it is

9 These terms are used interchangeably throughout this dissertation, even though they are not fully synonym, as will briefly be mentioned in paragraph .

10 World Commission on Environment and Development, *Our Common Future* (United Nations 1987) at p. 41 (commonly referred to as ‘Brundtland report’, after its chairman).

11 See also Sander R.W. van Hees, ‘Sustainable Development in the EU: Redefining and Operationalising the Concept’ (2014) 10 (2) *Utrecht Law Review* 60, at pp. 75-76 especially.

more a procedural requirement than a material one and a sustainable outcome is not ensured. For this reason, some have argued that sustainable development in its current form has failed.¹² Others call an interpretation of sustainable development that accords equal weight to the three elements 'weak sustainability', whereas 'strong sustainability' would entail an interpretation in which the environmental element is (to an extent) prioritised over the other two.¹³ Such strong sustainability could also be achieved by redefining the concept, for instance as 'development that meets the needs of the present while safeguarding the Earth's life-support system, on which the welfare of current and future generations depends.'¹⁴ Others explicitly acknowledge that sustainable development is (or ought to be) 'a systems approach in time and space' rather than a mere balancing act.¹⁵

Second, in its current form, sustainable development is a rather anthropocentric concept. As such, it does not sufficiently acknowledge, if at all, (i) human dependency on nature, (ii) humans as part of nature, nor (iii) any inherent value (or even right) of non-human lifeforms, ecosystems or elements thereof to exist. The concept now merely focuses on development, which implies growth under the current economic paradigm, and on the human species only. For actual sustainability to be achievable, and to implement a life-cycle oriented approach, it is needed to implement and maintain a more ecocentric focus. Hence, essentially, instead of centring the concept around balancing, sustainable development should come to reflect the factual hierarchical relationship between the economic, social and environmental dimensions. Under such a new notion, it is reflected that the environment sustains humankind, within who's societies the economy is only one element. This can be depicted as shown in Figure 1.

12 E.g. Rebecca M. Bratspies, 'The green economy will not build the rule of law for nature' in Christina Voigt (ed), *Rule of Law for Nature. New Dimensions and Ideas in Environmental Law* (CUP 2013) at p. 300.

13 Platjouw (infra n 21) at p. 128.

14 As proposed by David Griggs, 'Redefining Sustainable Development' (Project Syndicate, 19 March 2013), found at: <http://www.project-syndicate.org/commentary/redefining-sustainable-development-by-david-griggs>.

15 As stated by the International Institute for Sustainable Development, found at www.iisd.org.

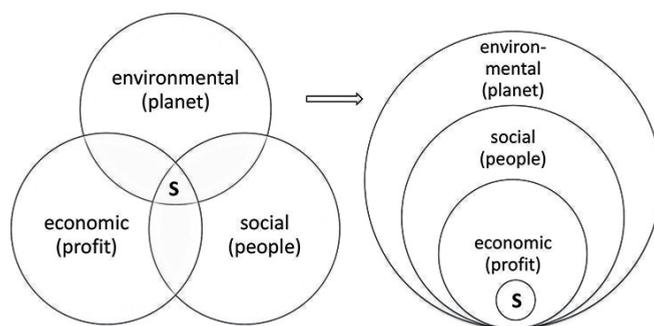


Figure 1.1: The redefined sustainable development concept

When conducting further literature research on the required paradigm (and subsequent legislative) change, I found that among legal scholars aiming at such change, two broad strands of reasoning can be distinguished. One group of scholars puts its faith in developing new legal instruments and concepts to protect our planet. Examples of this are advocating the adoption of ‘ecocide’ as a crime,¹⁶ or proposing the implementation of rights for nature in various forms.¹⁷ Another stream of thought focuses on what can be summed up as (a wide variety of differently defined) holistic approaches to environmental regulation and protection. The latter approach has served as the starting point for this dissertation, because it entails a life-cycle oriented focus that does justice to the circularity of ecosystems and life in general, as well as taking full account of human impacts thereon.

The terminology used in the existing literature is diffuse: While I often refer to a holistic approach, others refer to an integrated approach, circular approach, ecosystem approach or life-cycle approach.¹⁸ While the legal and institutional details that these authors envisage may differ at several points, I found that essentially they aim at the same thing: Avoiding further environmental degradation by lengthening the ‘chain of accountability’ and/or the chain of events and effects under consideration in decision making regarding various activities. Examples

16 Polly Higgins, *Eradicating Ecocide: Laws and Governance to Stop the Destruction of the Planet* (Shepherd-Walwyn, 2010).

17 See for instance Susana Borràs, ‘New Transitions from Human Rights to the Environment to the Rights of Nature’ (2016) 5(1) *Transnational Environmental Law* 113; or Christina Voigt (ed), *Rule of Law for Nature. New Dimensions and Ideas in Environmental law* (CUP 2013).

18 See e.g., in respective order: Dirk Scheer & Frieder Rubik (eds), *Governance of Integrated Product Policy: In Search of Sustainable Production and Consumption* (Greenleaf 2006); Chris Backes, *Law for a Circular Economy*, Inaugural Address, University Utrecht, 12 April 2017 (Eleven International 2017); Platjouw (infra n 21); Carl Dalhammar, *An emerging product approach in environmental law. Incorporating the life cycle perspective* (PhD Law 2007).

of such an approach can already be found in several pieces of European Union (EU) legislation, for instance in the concept of extended producer responsibility (EPR) in waste management,¹⁹ or the integrated approach in industrial emissions regulation.²⁰

When exploring the theoretical foundations of my research, two authors stood out in particular and their work will be addressed in more detail below. The first is Froukje Platjouw who advocates the 'ecosystem approach';²¹ the second is Olivia Woolley who proposes 'ecological governance' as a new paradigm.²² Both of their books provide solid theoretical foundations and justifications for the normative choices made, and could thus serve as the basis of my research. Furthermore, using their terminology allowed me to build on the existing scholarship, rather than having to reinvent the wheel.

1.2.2. Ecosystem approach

The ecosystem approach as advocated by Platjouw 'requires a governance approach that focuses on the geographical boundaries of the ecosystem, rather than the jurisdictional boundaries. It requires a holistic approach whereby ecosystem structure, functioning and productivity are in focus, rather than individual species, habitats or landscapes.'²³ This holistic dimension is supplemented by an integrative dimension, aimed at coupling the sustainable use of 'ecosystem services'²⁴ with maintaining the integrity of those ecosystems. Within this dual objective, supremacy is given to maintaining ecosystem integrity as this is vital to safeguard the ability of ecosystems to provide ecosystem services.²⁵

19 E.g. Directive 2012/19/EU of the European Parliament and of the Council of 4 July 2012 on waste electrical and electronic equipment (WEEE Directive) [2012] OJ L197/38.

20 E.g. Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) [2010] OJ L334/17 (Industrial Emissions Directive, IED), which is aimed at avoiding the shifting of pollution between different environmental media and ensuring the protection of the environment as a whole, see recital 3 & art. 1 IED.

21 Froukje Maria Platjouw, *Environmental Law and the Ecosystem Approach: Maintaining ecological integrity through consistency in law* (Routledge 2016). The ecosystem approach itself is not new and has been discussed in (legal) literature for decades. (See for instance James J Kay & Eric Schneider, 'Embracing complexity: The challenge of the ecosystem approach' (1994) 20(3) *Alternatives*; Waterloo 32.) While many other authors have also contributed significantly to the development of the concept, in this thesis I will only discuss the work of Platjouw, because it is specifically juridical, as well as comprehensive and recent.

22 Olivia Woolley, *Ecological Governance - Reappraising Law's Role in Protecting Ecosystem Functionality* (CUP 2014).

23 Platjouw (n 21) at p. 13.

24 Defined by Daily as 'the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfil human life.' (From: Platjouw (n 21) at p. 7.)

25 Platjouw (n 21) at pp. 13 & 72. At the same time, ecosystem services might be a good indicator of ecosystem integrity, Platjouw (n 21) at p. 75.

Hence, the work of Platjouw to a large extent revolves around the concept of ecosystem services.²⁶ The concept is used as a tool to rationalise decisions by monetising them (as much as possible) through the use of cost-benefit analyses. This allows for transparent balancing and integration of diverging interests.²⁷ While this approach certainly has its merits, it also has its limitations and drawbacks. First and foremost, for balanced decision making under this approach, it is essential that the (estimated) prices are set right. Assigning correct values to ecosystem services is in practice hard and complex, if not impossible, especially in relation to public goods. Secondly, these difficulties are exacerbated by the existence of uncertainties. For correct pricing, sufficient scientific knowledge is required on how certain underlying services contribute to more measurable ones.²⁸ A third, ethical objection to this methodology is that monetary valuations are anthropogenic in nature.²⁹ Nevertheless, using ecosystem services as the anchor point in decision making could significantly enhance the integration of the environmental dimension in such decisions and make this process more transparent.³⁰ As such, it is a rather pragmatic solution, and one that is probably easier to implement and execute than the more abstract approach advocated by Woolley.

1.2.3. Ecological governance

The concept of ecological governance as discussed by Woolley goes beyond the framework sketched by Platjouw, although there are many similarities. Both emphasise the importance of a holistic approach that centres around (the boundaries and the functioning of) ecosystems, rather than jurisdictions. However, Woolley is more principled than pragmatic in her approach, leading to an enhanced emphasis on ‘reducing the cumulative stresses on ecosystems’ rather than on ‘sustainable use of their services’. She thus takes a more ecocentric approach and strictly adheres to the concept of ecological law, by advocating the primacy of respecting ecological limits over economic and technological ones.³¹ As a result, in her policy proposals she reserves

26 Like the ecosystem approach, the concept of ecosystem services has also been discussed by many scholars (see e.g. the work of the IUCN, at <https://www.iucn.nl/en>, or of the Wageningen University, at <https://www.wur.nl/en/Dossiers/file/Ecosystem-services.htm>). However, as I dismiss the concept as a benchmark in this doctoral thesis, I will not discuss these works any further. Nevertheless, I will touch upon the concept briefly again in my conclusion, in paragraph .

27 Platjouw (n 21) at pp. 78-79.

28 Platjouw (n 21) at pp. 83-91.

29 Platjouw (n 21) at pp. 92-93; Woolley (n 22) at pp. 41, 45.

30 Platjouw (n 21) at p. 94.

31 See also: G Garver, ‘The rule of ecological Law: The legal complement to degrowth economics’ (2013) 5 *Sustainability* 316-337, at p. 323. Under ecological law, the planetary boundaries mentioned in footnote 1 form the backdrop of reviewing current policies.

a central role for normative precaution (which may require halting growth or development all together)³² and institutionalised learning coupled with adaptive governance.³³

1.2.4. *Ecosystem resilience*

The concept of resilience is discussed in the work of both Platjouw and Woolley. The term is an expression of the capacity of ecosystems to absorb disturbances and maintain (or return to) an equilibrium state throughout or after such disturbances.³⁴ As ecosystems are complex adaptive systems, their responses to such external shocks (whether natural or human-induced) are characterised by non-linearity and multiple potential stable states.³⁵ These non-linear responses lead to unpredictability as we cannot determine with certainty what or where the tipping points of the system are. Such tipping points are also closely related to the system's buffering capacity, which in turn is influenced by its level of diversity. In sum, the boundaries of ecosystem resilience are hard (or impossible) to define and resilience as such cannot be quantified, making it unsuitable as a benchmark for decision making.³⁶

At the same time, it is clear that reduced resilience increases the vulnerability of an ecosystem,³⁷ and may ultimately affect its functioning or integrity. Certain attributes of ecosystems can be regarded as indicators of the level of their resilience. Woolley mentions the diversity of species, the 'modularity' of its components, the existence of corridors between biodiverse hotspots (or the overall openness of the system) and more general reserves or capital assets that enhance the system's buffering capacity.³⁸ Safeguarding the functional complexity of ecosystems is thus essential, as its traits confer upon it flexibility, adaptability and an enhanced ability to withstand shocks.³⁹

1.2.5. *Demarcations*

While Platjouw uses ecosystem services as a practical tool to express ecosystem integrity, Woolley instead centres her research around the concept of 'ecosystem functionality' and advocates an 'ethic of humility' that 'seek[s] to capture a realistic conception of our place in nature'.⁴⁰

32 On the benefits of nonuse and nonuse values, see also Jan Laitos, 'Rules of law for use and nonuse of nature' in Christina Voigt (ed), *Rule of Law for Nature. New Dimensions and Ideas in Environmental law* (CUP 2013) at p. 211.

33 Woolley (n 22) at pp. 8-13. The details of her approach will also be discussed at length in the next chapters. Therefore, at this point I will only give a rudimentary outline thereof.

34 See more elaborately: Woolley (n 22) at pp. 6 & 27-36, or Platjouw (n 21) at p. 66.

35 Woolley (n 22) at p. 21.

36 See also Woolley (n 22) at pp. 6, 32-33 & 160-161.

37 Platjouw (n 21) at p. 67.

38 Woolley (n 22) at pp. 32-33. Platjouw also acknowledges that a high level of biodiversity generally enhances resilience as it provides functional redundancy (Platjouw (n 21) at p. 67).

39 Platjouw (n 21) at p. 73 and Woolley (n 22) at p. 33 respectively.

40 Woolley (n 22) at p. 18.

Thus, while less practical than Platjouw's proposals, Woolley's work provides a more accurate description of the factual position of humankind. Most noteworthy, her research expresses the notion that (i) humans are not above nature, but part of it, and that (ii) we are not omniscient and should therefore not uphold legal structures that require extensive knowledge of causal effects or prediction of events. Woolley does not provide a clear definition of ecological governance as such, but does extensively address what it would entail and what its implementation would require.⁴¹ Therefore, throughout this dissertation, her blueprint for implementation of ecological governance serves as guidance and my research is based (in line with Woolley's proposals) on the premise that 'a fundamental reappraisal is required of how we can use law to prevent our cumulative stresses from undermining ecosystem functionality'.⁴² As a result, the focal point of this research is on contributing to ecosystem functioning, rather than on enhancing ecosystem services or advocating sustainable development in its current form.⁴³ On top, further demarcation is applied by not delving into the question of the democratic legitimation and (the need for) public participation, which are dealt with at great length by Woolley, as well as by a broad array of academic authors.⁴⁴ Along a similar vein, this dissertation also does not address how the ideas expressed in it can be implemented in (political) practice, as that would require extensive research into (political) decision making, which would go far beyond the scope of this legal dissertation.⁴⁵ Nevertheless, I want to stress that these demarcations were applied for practical reasons and not for lack of importance of these topics.⁴⁶

1.2.6. EU energy law

A further focal point, and hence important demarcation, is that this doctoral thesis is centred around (secondary) EU energy law. However, this dissertation does not address the full body of EU energy (nor environmental law),⁴⁷ but merely assesses several aspects of energy law from an environmental perspective. This means that not the broad spectrum of EU energy law is considered and described, but that energy law is rather used as a lens, or focal point, to discuss those elements that particularly impact the environment and/or those elements that may serve as an illustration of holistic or ecological legal approaches. A broader context is provided, if so required for a clear understanding

41 As elaborated on in Chapter Three.

42 Woolley (n 22) at p. 5.

43 The latter demarcation is also the reason that much of the literature on how to balance the three different aspects of 'sustainable development' is not dealt with in great detail.

44 See in particular Woolley (n 22) at pp. 187-214.

45 The latter appraisal would necessarily also entail an assessment of and debate on the (perceived) costs of the new approach, which also fall outside the scope of this dissertation.

46 Hence, I do encourage further societal, political and academic research and debate on these issues.

47 For an extensive description of (EU) energy law, I refer to Martha Roggenkamp *et alia* (eds), *Energy Law in Europe. National, EU and International Regulation* (OUP 2016). For environmental law, see J.H. Jans and H.H.B. Vedder, *European Environmental Law: After Lisbon* (Europa Law Publishing, 2012).

The focus on the energy sector was chosen for three reasons. First and foremost, energy is ‘the life blood of society’⁴⁸ as it is essential for societal functioning and welfare. Simultaneously, energy production and consumption are a major source of GHG emissions and one the prime causes of climate change.⁴⁹ On top, its raw material use, transport and waste production have additional negative impacts on ecosystems all over the world. These notions should make energy the spill of any climate change mitigation strategy and reducing the negative effects from energy production and consumption would thus have a profound positive impact on ecosystems’ resilience. Addressing the regulation of the energy sector is therefore largely synonym to addressing the root causes of climate change. The second reason to focus on the energy sector is that its production chains are relatively easy delineable: The types of energy sources as well as their production processes are limited and so is the amount of actors involved throughout the production chains.⁵⁰ This makes the sector particularly suitable for a life-cycle oriented legal assessment. Thirdly, the sector has proven to be quite malleable, and hence potentially susceptible to drastic change. Over the last two decades, major structural changes have been accomplished via three consecutive legislative ‘energy packages’.⁵¹ These have resulted in the progressive liberalisation and integration of EU members’ energy markets. In particular, the so-called ‘unbundling requirements’ have altered the energy landscape tremendously in terms of its actors and their competences.⁵² Additionally, climate change concerns have spurred the development of new (renewable) energy sources,⁵³ which has also impacted the raw materials’ markets.⁵⁴

The rationale for focusing on EU energy law, rather than national energy law, is that for European countries this is the main stage for energy regulation, due to the creation of the internal market

48 European Commission, ‘Energy 2020 – A Strategy for Competitive, Sustainable and Secure Energy’ (Communication) COM(2010) 639, at p. 2.

49 ‘Greenhouse-gas emissions from the energy sector represent roughly two-thirds of all anthropogenic greenhouse-gas emissions’, according to the IEA. See IEA 2015b (n 3) at p. 20.

50 Although this number has increased significantly with the liberalisation of the energy markets, as discussed below, as well as due to the increasing importance of the forestry and agricultural sectors as suppliers for the energy sector.

51 The first package was adopted in 1996 (for electricity) and 1998 (for gas), the second in 2003, and the third in 2009.

52 ‘Unbundling’ refers to the (legal) separation of production and supply activities from transport (i.e. monopolistic, network-related) activities.

53 Stimulated primarily through Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC [2009] OJ L140/16 (Renewable Energy Sources Directive, RED).

54 Most noteworthy, the agricultural and forestry sectors are now important players in the energy market, as elaborated on in Chapters Two and Three.

in energy, as mentioned above.⁵⁵ On top, the EU as a block has much wider geographical (and jurisdictional) boundaries than any single Member State. This makes the European level more suitable to be assessed from an ecological, holistic perspective. Another reason to focus on the EU is that EU law is considered a separate, supranational legal order,⁵⁶ which is not the case for the global international arena.⁵⁷ Still, EU decision making requires international cooperation and its rules thus reflect international (regional) consensus on a particular topic. The lessons learned within the EU could thus serve as inspiration to achieve similar consensus at the global international level.

In general, EU energy policy is characterised by the trifurcated aim of ensuring affordability, sustainability and security of supply of energy.⁵⁸ The latter entails both the safety of the networks, as well as sufficient availability of energy.⁵⁹ As a result, a continuous balancing between these aims needs to take place in decision making. Thus, the normative framework that forms the backdrop of EU energy policy and law is confronted with issues and trade-offs similar to those that surround the concept of sustainable development.⁶⁰ Analogously, here too a life-cycle oriented approach in regulation could help to identify priorities and thus aid the design of increasingly sustainable energy systems.⁶¹

1.3. Research questions

From the above, the following main research theme underlying this doctoral thesis can be distilled:

How can we implement a holistic approach in EU energy law?

The assumption underlying this research problem is that such an approach would ensure that climate change and other environmental issues would be effectively dealt with. However, as this is a rather broad, general research theme rather than a workable question, further specifications and demarcations were required. The starting point for this consisted of making an inventory

55 This internal market is further strengthened by the founding of the Energy Union; European Commission, 'A Framework Strategy for a Resilient Energy Union with a Forward-Looking Climate Change Policy' (Communication) COM(2015) 080 final.

56 Case 26-62 *Van Gend & Loos v The Netherlands* [1963] ECR I.

57 The latter being the ideal stage for holistic regulations.

58 COM (2010) 639 final (n 48) at p. 2.

59 The latter also entails transport and supply to consumers. For an elaboration regarding electricity, see Hamilcar P.A. Knops, *A functional legal design for reliable electricity supply: how technology affects law* (Intersentia 2008) at p. 95.

60 The analogy applied here is the following: 'Affordable energy' can be considered the economic component, 'sustainability' represents the environmental element and 'security of supply' would be the social aspect.

61 As has been addressed in paragraph 1.2.1.

of the elements of life-cycle approaches currently present in EU energy law. From this, four sub-studies were conducted which in combination form the main content of this dissertation. Each study was based on the progressive insights stemming from the previous one and each study was published as a separate article. Three out of the four articles were published in double-blind peer-reviewed journals, and one was published in a single-blind peer-reviewed journal.⁶² Combined, these articles form the body of this dissertation.

From the initial inventory, it became apparent that the most prominent example of a holistic legislative approach is found in the EU rules on biofuels. For this reason, the first sub-study concerned an analysis of the precise scope and content of these biofuel rules, as well as on the rules on biomass used for energy production in a broader sense. The first sub-questions of this dissertation are hence:

1. *How is the sustainability of biomass for energy regulated under EU law?*
2. *Does this suffice to implement a holistic approach?*

Since this first study *inter alia* concluded that the current legal framework does not bring about a full holistic approach, the next sub-study investigated which means might be used to achieve this. In the conducted analysis, the concept of 'ecological governance' is used as a strategy to implement a holistic approach through the legislative instrument 'best available techniques' (BAT).⁶³ This led to the following sub-questions:

3. *What does ecological governance entail and require?*
4. *Can the concept of 'BAT' be used or modified to implement ecological governance?*

A reinterpretation of the concept of BAT as sketched in this study would significantly lengthen the chain of events and effects under consideration in decision making. Coupled with an ecological focus, this could lead to trade-restrictive measures, making it necessary to consider the implications thereof under international trade regimes. This led to the questions:

5. *Is an extended application of mandatory BAT compatible with international trade law?*
6. *Is it in particular compatible with the rules of the World Trade Organization (WTO)?*

62 The first three articles (Chapters Two to Four of this dissertation) were published in double-blind reviewed journals, while the fourth article (now Chapter Five) has been published in a single-blind reviewed journal.

63 As currently used in the regulation of industrial emissions under the IED (n 20).

In addition, this dissertation explores the concept of ‘technology neutrality’ which features prominently in the BAT-concept, as well as in various policy documents on the energy transition. Hence, the fourth sub-study revolved around the questions:

7. *How is technology neutrality used in legislative design?*
8. *Can the concept be used to foster innovations in the energy sector?*

The answers to the sub-questions and the more general findings from the sub-studies were then used to assess the broader, overall research theme in order to provide an answer as to how we might implement a holistic approach in EU energy law.

1.4. Methodology, aims and outline

This legal doctoral research has been conducted via extensive legal documentation and literature studies, resulting in four published articles. Its key sources have been the relevant EU legislation, case law, regulatory decisions, policy documents, several (trade) treaties, and diverse literature. While most literature stemmed from legal science, various sources came from natural sciences and economics. Thus, the legal literature research ranged from works on energy law, environmental law, ecological law and trade law to works on the regulation of ICT and nanotechnologies. The non-legal sources included works on environmental economics, life-cycle analysis, environmental science, and various descriptive reports, projections and policy documents on (the impacts of) energy and/or the environment. This essentially makes this dissertation an interdisciplinary literature desk research. Additionally, on several occasions, the research’ ideas, findings and proposals were presented at (international) conferences and meetings to receive feedback.⁶⁴ Additional, detailed feedback was received via the peer-review process that took place with every publication. The resulting articles form the body of this dissertation.

The research has essentially consisted of the following steps. It started out with very broad research theme, rather than a workable research question. The initial step was, therefore, to make an inventory of the legislation that was the relevant to this theme. This identification of applicable laws and judicial decisions was primarily conducted by studying legal documentation and legal handbooks. The next step was to lay the theoretical foundations for the normative choices and stances made throughout this dissertation and to formulate more precisely the required design of the legal framework to achieve the set goals. This was done via extensive literature research of both legal and non-legal sources. The insights thus gained were then used

64 E.g. EELF Conferences in Groningen, the Netherlands (2013) and Copenhagen, Denmark (2017); GESP meeting Groningen (2013); INRA meeting in Laon, France (2015); VMR Actualiteitendag in Utrecht (March 2016); LRN Conference in Groningen (2017).

(i) to assess to what extent the current regulatory frameworks already exhibit the desired traits, and (ii) if they do not, to determine what is missing. Additionally, attempts have been made to (determine how to) design legalisation that does have the desired traits. The latter has largely been led by a combination of progressive insights, associative processes and extensive use of teleological interpretation.

Furthermore, this doctoral thesis has a strong law reforming ambition, rather than a descriptive or systematising purpose.⁶⁵ As a result, stark normative choices and stances are made throughout the research.⁶⁶ These normative foundations underlying the research can be contrasted with the subsequent, objectively performed legal appraisal. What I have aimed to do is to provide a rudimentary blueprint of how we might structure our legal frameworks to be more in line with the factual interconnectedness and complexities of this planet, its life-sustaining ecosystems and our relationship to and position within that. Thus, I have tried to demonstrate that law can be used as powerful steering tool to enhance sustainability, and I have hinted at how we might do that. I have identified hiatuses in the current frameworks and have proposed means to resolve (some of) them. I have explored new approaches to EU energy law and have added new insights to the existing scholarship, by broadening and deepening existing concepts and coupling them with a holistic approach.⁶⁷

The resulting outline of this dissertation is as follows. Chapter Two discusses the EU legal framework on biofuels and biomass used for energy production.⁶⁸ Biomass was chosen as an example, because the sustainability criteria for biofuels imposed by the Renewable Energy Sources Directive (RED)⁶⁹ represent the most elaborate example of a life-cycle approach to energy regulation. The focal point of this chapter is hence to what extent the current framework

65 Different legal research styles are, for instance, discussed in Paul Chynoweth, 'Legal Research', in A. Knight & L. Ruddock (eds), *Advanced Research Methods in the Built Environment* (Wiley-Blackwell 2008) at pp. 29-31; and Ian Dobinson and Francis Johns, 'Qualitative Legal Research' in M. McConville & W.H. Chui (eds), *Research Methods for Law* (Edinburgh University Press 2007), in particular at pp. 19-22.

66 Hence, some of its contents border on the political. This is, however, not uncommon for legal theses, since '[l]egal rules are normative in character as they dictate how individuals ought to behave [and] make no attempt either to explain, predict, or even to understand human behaviour.' (Paul Chynoweth (n 65) at p. 30.) As a result, one's views of the world colour one's perceptions on how this world should be legally organised. Therefore, whether you view the normative stances in this thesis as a providing a better reflection of the realities at force, or as a tree-hugging hippie's utopia is up to you. However, one's perceptions should not detract from the legal analysis.

67 By focusing on the BAT-concept I have meant to illustrate that, while the 'overhaul' that I advocate may seem drastic, much can already be achieved by using existing and familiar (legal) instruments. This familiarity may reduce the sense of being overwhelmed by the magnitude of the task at hand, thus potentially aiding a more prompt implementation of a new approach.

68 This research was published as: R.A. Giljam, 'Towards a Holistic Approach in EU Biomass Regulation' (2016) 28(1) *Journal of Environmental Law* (JEL) 95-124.

69 Directive 2009/28/EU (n 53).

facilitates or enables a life-cycle approach. In this chapter, I have analysed the overall framework for biomass used for energy (which is much broader than the rules on biofuels) and have identified several omissions within the framework that may lead reduced sustainability of biomass uses.

Chapter Three then tries to remedy the situation by introducing the concept of ‘ecological governance’ as the new paradigm for policy making.⁷⁰ This chapter explores what the implementation of such an approach would require in legal terms and how it might be brought about. Here, I argue that the concept of ‘best available techniques’ (BAT)⁷¹ holds great potential in this regard, although significant changes would have to be made in its interpretation and application. These required changes are subsequently described and discussed, with an emphasis on the regulation of biomass.

Next, Chapter Four addresses the potential for extraterritorial effects that such a new interpretation of BAT might have.⁷² This is necessary, because the ideas and proposals made in the previous chapter may, if executed, lead to trade-restricting measures. Therefore, chapter 4 explores the legality of such measures, specifically in the light of the EU’s obligations as a member of the World Trade Organization (WTO). This discussion is centred around the concepts of ‘process measures’ and ‘likeness’ and the difficulties in defining and categorising ‘energy’.

In Chapter Five, I then go on to explore the role of ‘technology neutrality’, which is generally considered a core feature of the BAT concept, as well as a policy objective for EU energy legislation.⁷³ In this chapter, several EU (energy) directives are assessed in terms of their level of such neutrality. Additionally, it is discussed whether technology neutrality in legislation does indeed enable and/or incentivise the technical innovations that are required for a more sustainable energy system. In this discussion, the existence of uncertainties and externalities features prominently.

70 This research was published as: R.A. Giljam, ‘Better BAT to bolster ecosystem resilience: Operationalising ecological governance through the concept of Best Available Techniques’ (2017) 26(1) *Review of European, Comparative & International Environmental Law (RECIEL)* 5-18.

71 As currently used under the Industrial Emissions Directive (IED) (n 20).

72 This research was published as: R.A. Giljam, ‘Extended application of ‘Best Available Techniques’ as a means to facilitate ecological governance: Assessing the legality of an ecologically oriented interpretation in the European Union (EU) of ‘Best Available Techniques’ (BAT) under international trade law and in particular in relation to energy production’ (2018) 36(2) *Journal of Energy and Natural Resources Law (JERL)* 181-208.

73 This research was published as: R.A. Giljam, ‘Implementing ecological governance in EU energy law: the role of technology neutral legislative design in fostering innovation’ (2018) 27(6) *European Energy and Environmental Law Review (EEELR)* 236-250.

Chapter Six then provides overall conclusions on the basis of the conducted research. It gives direct answers to the research questions as set out above and it assesses the findings of the research in more general terms, especially their meaning for future policy making and the implications for legislative design.

These chapters are followed by six annexes, that contain (i) a policy update, (ii) three posters that depict this dissertation visually, (iii) an English summary, (iv) a Dutch summary (Nederlandse samenvatting), (v) acknowledgements, and (vi) my curriculum vitae. The policy update was added because the articles that form the body of this dissertation were published between 2015 and 2018, and legislative and policy changes have occurred since then or are expected to be adopted in the near future. Please be aware that, since the articles were put into this book exactly as published, they have to be placed within the timeframe of acceptance of that particular manuscript.⁷⁴

74 That is: the latest, pre-copy edited author version of each article was used for in this dissertation. Differences with the published versions are due to changes made in copy-editing and after proof-reading. Also, I have added the full 'late amendments' to the article published in JEL (now Chapter Two), while only part of this list was published in the journal itself. Any inconsistencies in the style of the footnotes throughout this dissertation are caused by differing requirements of the different journals. Permission for re-use of the articles was obtained in writing from all journals.

