

The Conditions for Future Energy-Smart Water Utilities under EU and Danish Law and Policy

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1 Introduction

Water and energy services are interdependent. Water is an integral part of electric-power generation; it is used directly in hydroelectric generation, and it is also used extensively for cooling and emissions scrubbing in thermoelectric generation.¹ Energy is also an integrated part of water services, as satisfying water needs for supply, purification, distribution, and treatment of wastewater requires energy sources.² European water and energy service providers/users generate over one third of the EU's CO₂ emissions,³ so the two sectors have a high 'carbon footprint'.⁴ Water and energy services are, however, not only emitters of greenhouse gas (GHG) – they are also themselves recipients of climate change, as climate trends have an impact on both water and energy services – especially as the result of increased air and water temperatures. Recent weather conditions could restrict the supply of secure, sustainable, and affordable water and energy services critical to the welfare of all societies.

Water utilities are regulated at international, EU and national level without a specific focus on the interdependency of the two sectors.⁵ In respect to the climate change challenges, *traditional* energy law is focused on mitigation obligations (actions taken to reduce climate change effects),⁶ and water law is focused on adaptation (efforts to adjust to climate change in order to cope with its consequences).⁷ As already mentioned, the energy sector is not immune, however, to the physical impact of climate change and must adapt.⁸ The water

1 US Department of Energy, *Energy Demands on Resources. Report to Congress on the Interdependency of Energy and Water*, December 2006, p. 17-20; and The European Water Platform, *Water and Energy Strategic vision and research needs*, September 2011, p. 8-9.

2 See the European Water Platform, *op. cit.* report, p. 7-8. The US Department of Energy estimates that moving and treating water represents nearly 4 % of total electricity consumption in the US, and when end uses of water are considered, approximately 13 % of total primary energy consumption in the US results from water use; the US Energy Sector Vulnerabilities to Climate Change and Extreme Weather, July 2013, p. 5; the US Department of Energy report from 2006 on *Energy Demands on Resources*, p. 25-27.

3 The European Water Platform, *op. cit.*, p. 6.

4 The 'footprint' is the total amount of greenhouse gas (GHG) emissions caused directly and indirectly by a nation (equivalent to consumption emissions), a business, a product (equivalent to lifecycle emissions) or a person. Concerning foot printing, see the United Kingdom's Committee on Climate Change, *Reducing the UK's carbon footprint and managing competitiveness risks*, April 2013.

5 Andrew Jordan, Andriaan Schout and Anthony Zito, *Coordinating European Union Environmental policy: Shifting from passive to active coordination?*, 2004, available at "www.prototype2010.cserge.webapp3.uea.ac.uk/sites/default/files/edm_2004_05.pdf".

6 The energy sector is by far the largest source of GHG emissions, accounting for more than two-thirds of the total in 2010, around 90 % of energy-related GHG emissions are carbon-dioxide (CO₂), and around 9 % are methane (CH₄). See the International Energy Agency (IEA), *Redrawing the Energy-climate Map*, World Energy Outlook Special Report, June 2013, p. 11.

7 Tine Sommer, *Can Law Make Life (too) Simple? From gene patents to the patenting of environmentally sound technologies*, 2013, p. 50-51.

8 International Energy Agency (IEA), *op. cit.*, p. 11.

sector is also not without GHG emissions and must fulfil mitigation obligations. So the difference in the legal approach to climate change between energy and water legislation is one of the issues that illustrates the need for a review of the traditional legislative approach. The European Water Platform has recommended that the objectives on climate mitigation measured by renewable energy and energy efficiency etc. should be matched by the water industry.⁹ It states that:¹⁰

“... the existing political frameworks, energy and water policies are developed largely in isolation from one another – a fragmentation that is resulting in unsustainable developments in both sectors, and sometimes with conflicting objectives ...

The challenge for policymakers and industry alike is to develop effective policies, processes and analytical tools that allow an integration of energy-water nexus into policy and investment decisions. Research is needed on identification and evaluation of existing integrated policy-assessment measures and development of new or adapted ones that would enable identification, specification and analysis of the water implications of energy proposals, and vice versa. Research must help answer questions like: What is the impact of water policies and regulations on energy supplies and demands? What is the impact of energy policies and regulations on water demands and availability? How do policies aimed at climate mitigation and adaptation affect policies developed in the energy and water sectors, and, specifically, the energy-water nexus? What kind of regulatory framework is necessary and feasible to minimize the negative trade-offs in the energy-water nexus in both public-sector planning and private enterprise?”

This article highlights the possibilities presented by sustainable consumption¹¹ and production of energy, and on turning waste and hot water into a renewable energy resource in energy-smart water utilities. The ambition behind this article is to answer the question: *what are the legal conditions for water utilities in the European Union (EU) to deliver more environmental benefits to society by generating renewable energy through the use of the hot water and biogas at their facilities and so play an important role in the public energy service system?* It is also the ambition to answer the question: *are the conditions less favourable at the national level (in Denmark) than necessary under EU law?*

Part II of this article explains the interdependency between water services and energy services, the characteristics of energy-smart water utilities, and the traditions with regard to policy making at international, EU and national levels. The EU constitutional principles and rules of importance for the competences of

9 The European Water Platform, op. cit. report, p. 10-11.

10 The European Water Platform, op. cit. report, p. 15.

11 The costs of energy use in water utilities are, in a global context, estimated to cover between 5 %-50 % of total operating cost in the introduction to the World Bank's Energy Sector Management Assistance Program (ESMAP), *A Primer on Energy Efficiency for Municipal Water and Wastewater Utilities*, technical report 001/12. It also concludes that the share is usually higher in developing countries.

the EU institutions and member states are explained in part III. It is stated in this part of the article that EU law as well as the praxis of the European Court of Justice (EUCJ) leaves sufficient leeway to member states to make their own choices. EU law does not stipulate the division of powers and responsibilities between national, regional and local administration, and the EUCJ has established in its case law that the national procedural rules¹² as well as the institutional set-up in the relevant member state generally apply to cases where national law implements EU law. The EU's secondary law establishing the conditions for water utilities taking part in energy services are described in part IV. This describes how the EU energy and environmental policies are inextricably bound up with each other, particularly when it comes to climate change legislation.¹³ The policies rest on the concept of sustainability, including resource-saving concepts, and the ambitions for the co-ordination of energy, climate and environmental goals. As in other member states, the choice of means to be used to ensure correct implementation of EU law in Denmark depends on a number of traditions.¹⁴ The results of the interaction between the Danish political and legal traditions and the implementation of EU law on energy, and national legal obstacles to environmental conditions for energy-smart water utilities, are described in part V. The article ends with part VI, where the above-mentioned questions are answered in some concluding remarks.

2 Interdependent and Climate-sensible Services with a High 'Carbon Footprint'

The need for more focus on the interdependency of water and energy services and the climate resilience of the water and energy sectors in the regulatory systems is starting to appear on the European agenda.¹⁵ It is recognised that welfare and green growth rest heavily on an appropriate supply of safe water, the provision of adequate sewerage, and on energy services – and that these services are interdependent and have to be based on efficient and sustainable

12 With two modifications: the 'principle of equivalence' means that the procedure in EU cases must be equivalent to the procedure for domestic cases. The other principle, the 'principle of effectiveness', means that the national procedure cannot render implementation of EU law ineffective.

13 German Advisory Council on the Environment, *Pathways towards a 100 % renewable electricity system. Special report*, October 2011, p. 175.

14 Denmark, as a member state, is usually considered part of the Nordic tradition that is neither clearly based on civil law nor on common law. Concerning this issue, see Ole Due, *Danish Law in a European Context*, in Børge Dahl, Torben Melchior and Ditlev Tamm (eds.), 2002, p. 11-32; and Constanze Semmelmann, *The Public-private Divide in European Union Law*, in Ulla Neergaard and Ruth Nielsen (eds.), "European Legal Method – in a Multi-Level EU Legal Order", 2012, p. 194.

15 The European Water Platform, op. cit. report, p. 10-11.

use of the world's resources.¹⁶ A report published in June 2012 by the Committee on the Environment, Public Health and Food Safety of the European Parliament – with the title “the implementation of EU water legislation, ahead of a necessary overall approach to European water challenges” – underlines that an environmentally and economically sound water sanitation and wastewater management policy should encourage the use of wastewater and the by-products of end-of-pipe treatment as a new resource on the basis of stringent quality requirements. The Committee:

“notes that wastewater can be used as a source of energy by recovering the heat or energy from the organic matter it carries, and that this opportunity should be exploited.”¹⁷

Generally, the services of water utilities¹⁸ are categorized as: (a) services provided in relation to the supply of drinking water, and (b) services provided in relation to the collection and treatment of wastewater. But is it possible to use a parallel concept based on the best available technology? The answer to this question is yes. The shift to a smart grid – with the possible involvement of energy-smart water utilities as flexible ‘prosumers’ – requires both new technologies and transformative regulatory change.¹⁹ Such advanced technical systems are actually ‘siloes’, not interconnected.²⁰ This article does not focus on the siloed technology approach, but on the siloed legislative approach.

2.1 A Picture of Energy-smart Water Utilities – Water Utilities of the Future

Instead of *solely* collecting, transporting and cleaning wastewater and ensuring water supply services, energy-smart water utilities *also* reduce their carbon footprint through energy efficiency, material recovery by utilization of sewage sludge in the production of biogas,²¹ ensuring renewable energy storage

16 Concerning the need for water services, see Mónica García Quesada, *Water and Sanitation Services in Europe. Do Legal Frameworks provide for “Good Governance?”*, Centre for Water Law, Policy and Science, University of Dundee, May 2011, p. 20.

17 Report A7-0192/2012 of 6 June 2012, p. 7.

18 Water services are defined as public goods that have a social and economic value in all competed uses, *cf.* Article 4 of the *Dublin Principles of Water* adopted at the International Conference on Water and Environment in Dublin in 1992.

19 Joel B. Eisen, *Smart Regulation and Federalism for the Smart Grid*, Social Science Research Network, 2013, p. 3-6.

20 Joel B. Eisen, *op. cit.*, p. 8-10.

21 Biogas is produced when bacteria breaks down organic matter in an atmosphere with little or no oxygen. Treatment of the sewage sludge by means of anaerobic digestion (AD) generates biogas. AD is a treatment process that breaks down the biodegradable material in the absence of oxygen and produces a methane-rich (CH₄-rich) biogas. CH₄ is a GHG gas with a global warming potential of 21 (1 tonne of CH₄ emission corresponds to 21 tonnes of carbon dioxide (CO₂)).

capacity, and by producing renewable energy using hydropower facilities. Participation in electricity production demands that the utilities invest in financially attractive on-site energy generation, such as utilization of biogas from anaerobic sludge digesters.²²

The recovered waste materials from water utilities are replacing virgin materials and fossil-fuel energy sources in energy production and are reducing the traditional waste management needed, with positive effects for the mitigation of GHG²³ and for several other interests to society.²⁴ Covering slurry stores to collect the biogases²⁵ produced at wastewater treatment facilities avoids the release of some of the GHG. At larger facilities, economies of scale mean biogas can be conveyed off-site for use in combined heat and power plants (CHP) to generate electricity for general use by means of transportation in the grid. Technological developments make it possible to inject bio-methane (processed biogas) into the natural gas grid. Bio-methane can also be used in the production of second-generation biofuels for use as fuel in the transport sector. The bio-methane produced at the water utilities can also be used to produce second-generation bio-liquids to be used for heating and electricity.²⁶

The utilities can also act in future 'Smart Grids'²⁷ as smart final consumers, as well as producers of renewable energy (known as 'smart prosumers').

2.2 Sector-specific Solutions Versus Need for Multifunctional Strategies

The national traditions of sector-specific agencies, the international technical specialized agencies under the United Nations, and the international as well as the regional technical cooperation networks have consequences for the

22 Energy Sector Management Assistance Program, op. cit., p. 20-21.

23 The GHG of particular relevance to waste management are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). See the Governing Council of the UNEP, which has directed its International Environmental Technology Centre (IETC) branch to take action in the area of waste management, as there are substantial co-benefits of waste management in the context of climate change, cf. UNEP *Waste and Climate Change. Global Trends and Strategy Framework*, 2010.

24 Combustion of fuels in stationary installations contributes significantly to emissions of a range of pollutants, including sulphur dioxide (SO₂), oxides of nitrogen (NO_x), carbon dioxide (CO₂), and particulate matter (PM).

25 Biogas is a mix of CO₂ and the inflammable gas methane (CH₄), which is produced by bacterial conversion of organic matter under anaerobic (oxygen-free) conditions.

26 Natural gas is the only fossil fuel to increase its share of fuel consumption. Substitution of coal and oil with gas in the short to medium term is regarded as a help to reduce CO₂ emissions using existing technologies by at least 2030 or 2035. Gas-fired power stations are also relatively flexible in use.

27 Smart grid refers to an electricity grid that uses communication and information technologies to connect consumers and producers to a common infrastructure system based on energy efficient and renewable energy production.

functional set-up and the independent institutional structure of the strategies for the future as well as legal circles.²⁸

The Brundtland Commission in its report of the World Commission on Environment and Development – titled “Our Common Future” – recognises the importance of considering the ecological/resource dimension alongside economic and social dimensions, stating that the integrated nature and interdependency of the new global challenges and issues today contrast sharply with the nature of the institutions that exist:²⁹

“These institutions tend to be independent, fragmented, and working to relatively narrow mandates with closed decision processes. Those responsible for managing resources and protecting the environment are institutionally separated from those responsible for managing the economy. The real world of interlocked economic and ecological systems will not change: the policies and institutions must.”

The concept of sustainability addresses the need to balance and coordinate divergent collective interests, while protecting the regenerative capacity of nature in a concerted effort to synthesize and integrate environmental and development issues. The multi-faceted character of global change, urbanization and resource needs makes multifunctional strategies covering all sectors and interdependency between sectors vital.

Current EU law is a special legal order – it is neither international nor national law.³⁰ As illustrated and explained in modern legal and political science theories, the development of EU policy and law is interrelated to the development of international as well as national law.³¹ The EU takes part in several conventions, protocols and declarations together with its member states, and the EU is involved in international water-related and energy-related partnerships on a broader basis, acting on the basis of sector-specific approaches – so silo-thinking also forms part of the EU institutional set-up.

28 The EU launched, for example, initiatives at the World Summit on Sustainable Development (WSSD) in 2002, including the Water Initiative and the Energy Initiative as part of external action. Concerning this, see the Communication “External Action: Thematic Programme For Environment and Sustainable Management of Natural Resources including Energy”, COM(2006) 20 final, p. 5. See also Catherine Brölmann, *Deterritorialization in International Law: Moving Away from the Divide Between National and International Law*, in Janne Nijman and André Nollkaemper (eds.), *New Perspectives on the Divide Between National & International Law*, Oxford University Press, 2007, p. 91 with reference to Martti Koskenniemi and others, *Fragmentation of International Law: Difficulties arising from Diversification and Expansion of International Law: Report of the Study Group of the International Law Commission* (13 April 2006), p. 11 and p. 244-248.

29 WCED, *Our Common Future*, 1987, p. 310.

30 Tine Sommer, op. cit., p. 119-131; Anne-Marie Slaughter and William Burke-White, *The Future of International Law is Domestic (or, The European Way of Law)*, in Janne Nijman and André Nollkaemper (eds.), *New Perspectives on the Divide Between National & International Law*, 2007, p. 112.

31 Concerning the legal development, see Tine Sommer, op. cit., p. 59-67 with reference to the theories and publications of several social scholars.

But, as will be explained infra, the concept of sustainability has helped the EU to adopt a more holistic approach.

2.3 *Initiatives on Future Smart Water Utilities in US*

As mentioned above, there are currently some initiatives in Europe focusing on making water utilities more energy smart. Such initiatives can also be found in the United States (US). Three major American clean water groups³² released a strategy document in February 2013 entitled “The Water Resources Utility of the Future: A Blueprint for Action”, calling for transformational thinking in policy and legislation. On a basis of interviews with stakeholders, the document states that:

“... none will be more important than the regulatory environment”

for better resource efficiency in the water sector. The US Clear Water Act is based on a 40-year old approach, so the US water sector needs an updated legal framework.³³

The US Department of Energy published a report in July 2013 on “US Energy Sector Vulnerabilities to Climate Change and Extreme Weather”. This report states that the energy sector needs greater climate resilience. It concludes that the interdependencies within and across the energy sector and the water sector must be better understood to effectively ensure resilience.³⁴ The conclusion is that the solutions of the future have to be based on collaboration across government agencies and the public and the private sector. Existing legal obstacles to responding effectively to these challenges include a lack of a policy framework or adequate market signals for investments in resilience.³⁵ Possible future opportunities include (among others) the development of energy/water-efficient and energy-smart appliances and equipment, as well as partnerships and initiatives between electricity and water utilities.³⁶ With regard to opportunities in relation to innovation and deployment policy and strategy, the report states that an improved framework of enabling policies would further accelerate deployment of the technologies and approaches needed by society to build a climate-resilient energy sector in a timely manner.³⁷ Among the specific

32 A Clear Commitment to America’s Waters (NACWA), the Water Environmental Research Foundation (WERF), and the Water Environmental Federation (WEF).

33 See p. 11 of *The Water Resources Utility of the Future: A Blueprint for Action*, (published on the internet by the organizations mentioned).

34 Of all the water use sectors (e.g., energy, agriculture, industry, and residential), thermoelectric power generation uses the largest fraction of freshwater in the US, estimated at approximately 40 % of all freshwater withdrawals, see p. 22 of the report.

35 See p. 36 of the report.

36 See p. 37-45 of the report.

37 Citation from the *Opportunities: Innovation and Deployment Policy and Strategy* chapter on p. 45 of the report.

opportunities in the area of improving the enabling policy framework for energy-smart water utilities, the Department report mentions the needs for consideration of the impact of water policies and regulation on the energy sector and vice versa.³⁸

2.4 EU Policy on Resource Efficiency and Low-carbon Energy

Several EU and international strategies have been presented on proactive resource management/efficiency to ensure sustainable conditions for future generations, a large proportion of whom will live in cities.³⁹ The current general EU policy “Europe 2020: Smart, Sustainable and Inclusive Growth”⁴⁰ – adopted as the general EU policy reform in 2010 – offers a vision of Europe’s social market economy for the 21st century. Among the important priorities presented is achieving the targets set by the “EU Climate and Energy Package”, see *infra* parts 4.2.-4.4.⁴¹ This Package aims to achieve a 20 % share in energy consumption originating from renewable energy sources (RESs) and a 20 % reduction in primary energy use – based on projected levels – through improved energy efficiency under conditions set out by the secondary legislation. The EU’s resource-efficiency policy is formulated in the general “Resource-efficiency Europe – Flagship under the Europe 2020 Strategy”;⁴² sector-related strategies are laid down (for example the bio-economic strategy);⁴³ and it is supported by the 7th Environmental Action Programme “Living well, within the limits of our planet”.⁴⁴ The Resource-efficiency flagship initiative advocates stepping up the use of market-based measurements (MBM), phasing out environmentally harmful subsidies, and making tax systems greener. The

38 See p. 45 of the report.

39 The United Nations (UN), the OECD and its International Energy Agency (IEA), the Energy Charter, the Johannesburg Renewable Energy Coalition (JREC), the International Renewable Energy Agency (IRENE) and the G8/G20 have all emphasised the importance of the rational use of energy. The UN declared 2012 the ‘International Year of Sustainable Energy for All’ and the Rio+20 Summit in June 2012 represented an important opportunity for action. The IEA has assessed the threats and opportunities facing the global energy system based on a rigorous quantitative analysis of energy and climate trends in *World Energy Outlook 2011*.

40 COM(2010) 2020. The strategy has been designed as the successor to the former Lisbon Strategy, which has been the EU’s reform strategy for the last decade. The European Council agreed to the proposal on 26 March 2010.

41 In March 2007 EU leaders endorsed an integrated approach to climate and energy policy that aims to combat climate change and increase the EU. The package was presented by the Commission on 23 January 2008 in the Communication *20 20 by 2020. Europe’s climate change opportunity*, COM (2008) 30 final. It was adopted in December 2008.

42 The European Commission’s Communication of 26 January 2011, COM(2011) 21. The strategy is one of seven flagship initiatives as part of the Europe 2020 strategy.

43 European Commission, *Innovating for Sustainable Growth – A Bioeconomy for Europe*, COM(2012) 60 final.

44 Proposal of 29 November 2012, COM(2012) 710 final.

Communication of 20 September 2011 on the “Roadmap to a Resource Efficient Europe”⁴⁵ follows up on the aforementioned flagship. With reference to the need for resource-efficiency policy, this states that European societies might need to rethink the way energy is produced and consumed. The policy should also be viewed in the context of worldwide efforts to achieve a transition towards a green economy. This Roadmap includes several milestones on sustainable consumption and production, as well as on turning waste into a resource, phasing out environmentally harmful subsidies, getting the prices right, and reorienting the burden of taxation.

The Energy Roadmap 2050⁴⁶ explores the challenges posed by delivering the decarbonization objectives while at the same time ensuring security of energy supply and competition. It argues that a European approach to the energy challenges will increase security and solidarity and lower costs compared to parallel national schemes by providing a wider flexible market for new products and services. The scenarios on structural changes for the energy system in the Roadmap show a transition from the current system, with high fuel and operational costs, to an energy system based on more renewable sources, higher capital expenditure and lower fuel costs. On 31 January 2011, the Commission adopted a Communication entitled “Renewable Energy: Progressing towards the 2020 target”⁴⁷ and “A Roadmap for moving to a competitive low-carbon economy in 2050”,⁴⁸ inviting further investments in renewable energy source-specific technologies through private-public partnerships and local forms of financing mechanisms. On 27 March 2013, the “Green Paper. A 2030 framework for climate and energy policies” was published. These strategies are all relevant for the future of energy-smart water utilities.

3 Treaty Provisions Established by the Treaty of Lisbon

The Treaty of Lisbon, signed on 13 December 2007, entered into force on 1 December 2009. It includes the Treaty on the European Union (hereinafter TEU), the Treaty on the Functioning of the European Union (hereinafter TFEU) and several protocols. Protocol No 26 “On services of General Interest”, setting out the shared values of the EU in respect to such services, and Protocol No. 27 “On the Internal Market and Competition”, setting out the fundamental market principles for business activities, are some of the protocols that are included as an integral part of the Treaty of Lisbon. These EU treaties and the protocols are legal sources at the same level as the highest-ranking legal sources. They have established a legal order with broad concepts and principles based on the nature of the project of European market integration. The articles of the treaties and

45 COM(2011) 571 final.

46 COM(2011) 885/2.

47 COM(2011) 31 final.

48 COM(2011) 112 final.

protocols bind the EU institutions, and some of the rules are also binding on member states.

The legal order of the EU rests on commonly accepted constitutional principles and constitutional elements that directly flow from the aims and values in the preamble and Articles 1-3 of the TEU, which can also serve as a yardstick and standard in interpretation.⁴⁹ Article 3(3) TEU states that the Union shall establish an internal market, and it shall work for the sustainable development of Europe based on balanced growth. The intent behind the Union's policy is to facilitate sustainable development by use of means that respect trade and environmental policy. The focus on sustainable development can be understood in light of the development of international environmental law.⁵⁰

The member states have accepted the central EU goals and principles by signing and ratifying the Lisbon Treaty. The interface between goals and principles has to be handled on the basis of case-by-case decision-making.

3.1 Environmental Policy Integration

Among the treaty provisions that are generally applicable, as stated in Part II of the TFEU, Article 11 establishes the principle of integration as a general guiding principle:

“Environmental protection requirements must be integrated into the definition and implementation of the Union policies, in particular with a view to promoting sustainable development.”

On the basis of Article 11 TFEU, the institutions with competences in the EU are directly responsible and fully accountable for ensuring that the policies and legislation of the EU on water and energy services respect the principle of

49 Janneke Gerards, *Judicial Arguments in Fundamental Rights Cases – the EU Courts' Challenge*, in Ulla Neergaard and Ruth Nielsen (eds.) *European Legal Method – in a Multi-Level EU Legal Order*, 2012, p. 35.

50 In 1972, a change to the Treaty on the European Community (EEC) added a focus on environmental issues by introducing a quantitative and a qualitative economic development approach without using the term 'environmental protection'. The same year, the UN Conference on the Human Environment (the Stockholm Conference) began global development of a new international environmental law. The Single European Act, from January 1987, changed the EEC Treaty again, and this change included new treaty rules on environmental protection in a separate chapter. The same year, the UN Commission – the Brundtland Report – presented its report “Our Common Future”, a guiding international concept for sustainable development, see *supra* concerning institutions. The TEU, which included an explicit reference to environmental protection on a sustainable basis, became effective on November 1993, one year after the UNCED Conference in Rio. The Treaty of Amsterdam (from May 1999) was the next step forward with a preamble stressing that the Commission shall promote a harmonious, balanced and sustainable development of economic activities. The Treaty of Nice (from 2001) did not address the environment.

integration. This principle of environmental policy integration – also involving resource efficiency – is the most fundamental legal aspect of sustainability.⁵¹

3.2 Constitutional Principle of ‘Services of General Interest’

Water and energy services are typically services of general economic interest – being publicly or privately owned.⁵² As an important provision with general application for both EU institutions and member states, Article 14 TFEU states⁵³ that they are obligated – as part of the shared values of the Union, as well as part of their role in promoting social and territorial cohesion, – to ensure that ‘services of general economic interest’ operate on the basis of principles and conditions, particularly economic and financial conditions, which enable them to fulfil their missions.

General economic interest services are defined as commercial services considered as being in the general interest for the society on which the public authorities impose specific obligations. EU law and national law encumber the provision of such services with a number of standards relating to access, quality, price, and continuity of the service provided, alongside special provisions relating to vulnerable classes of consumers.⁵⁴

3.3 Competition Conditions for ‘Services of General Interest’

The competition rules applicable to European undertakings⁵⁵ are laid down in Articles 101-105 TFEU. These rules ensure the competence of EU institutions to reduce the rights of freedom to contract and rights to property by a prohibition on (and control of) anti-competition caused by market dominance.

Article 101(1) prohibits all agreements between undertakings, decisions by associations of undertakings and concerted practices, which may affect trade between member states, and which have as their object or effect the prevention,

51 Sustainability as a part of the EU constitution is stated in Article 3 TEU as mentioned above.

52 The concept of ‘public service’ does not correspond to the concept of ‘public sector’.

53 Article 14 TFEU is without prejudice to the principle of conferral (Article 4 TEU), the treaty rule on public undertakings, and undertakings to which member states grant special or exclusive rights (Article 106 TFEU), and the prohibition of state aid (Article 107 TFEU).

54 *Controlling Dominance in European Markets*, Fordham International Law Journal, Vol. 33, Issue 6, 2011, p. 1764; and Ulla Neergaard, *Priviligerede virksomheder*, in Caroline Heide Jørgensen et.al. (eds.) “Konkurrenceretten i EU”, 2009, p. 1764.

55 An ‘undertaking’ is defined in functional terms as “every entity engaged in an economic activity, regardless of the legal status of the entity and the way in which it is financed”, see Case 41/90 *Höfner & Elser*, and the reference to this judgement in Constanze Semmelmann, op. cit., p. 203. Public services – services of public interest or public utility, such as electricity, gas and water supply, transport, postal services, and telecommunications – are economic activities of general interest set up by the public authorities and operated by them or by delegated separate operators (public or private).

restriction or distortion of competition.⁵⁶ Article 102 does not prevent the holding of a dominant position, but it does prevent abuse of such a situation by prohibiting activities affecting inter-member state trade. The Council, in Articles 103-105, has the competence to lay down appropriate regulations or directives, and the Commission, by enforcement, shall ensure the application of the principles laid down in Articles 101-102, as well as the provisions laid down in the Council's regulations.⁵⁷

The CJEU has stated with regard to free movement on the internal market (freedom of establishment,⁵⁸ the freedom to provide services,⁵⁹ and free movement of capital),⁶⁰ *versus* the fundamental rights of equality of treatment etc.,⁶¹ that such conflicting rights must be balanced against each other.⁶² This balancing exercise is governed by the usual justification test for restrictions on competition/free movement, which requires that the means applied to achieve the legitimate restriction must be appropriate and necessary.⁶³

In the case of public undertakings and undertakings to which member states grant special or exclusive rights on services of general interest, the member states shall – based on Article 106(1) – neither enact nor maintain in force any measure contrary to the rules contained in the treaties. On the basis of Article 106(2) TFEU, the member states can shield certain privileged undertakings – for example energy and water services – from the market. Article 106(2) states that:

56 Pro-competitive benefits produced by such agreements that outweigh the anti-competitive effects can make the agreement legal if four conditions stated in the exemption rule are proved by the undertaking(s), see the rule on 'efficiency defence' in Article 101(3).

57 Under Article 17(1) TEU, legal responsibility for ensuring compliance with directives falls in the EU system to the Commission. In cases of suspected non-implementation, it initiates Article 258 TFEU infringement proceedings. Invariably, these proceedings begin informally, with a series of bilateral negotiations between the Commission and the member state. Typically, this is sufficient to settle legal disputes. Where the dialogue fails to produce a satisfactory conclusion, proceedings may move to a formal stage, where the Commission sends a 'formal letter of notice', detailing the grounds for the suspected infringement, and inviting feedback from the member state. If a satisfactory response is not forthcoming, the Commission may deliver a 'reasoned opinion', laying out its view of how member state action remains inadequate, and establish a deadline to rectify the infringement. Failure to comply with the reasoned opinion may result in the case being referred to the ECJ.

58 For the right to take up and pursue activities as self-employed persons and to set up and manage undertakings, in particular companies or firms, see Article 49 TFEU.

59 Article 56-62 TFEU.

60 Article 63(1) TFEU.

61 The principle of non-discrimination is stated in Articles 49 and 56 TFEU with direct effect.

62 Ruth Nielsen, *op. cit.*, p. 95-96, with reference to Case C-36/02 *Omega Spielhallen*, where ECJ held that the freedom to provide services does not preclude an economic activity from being prohibited on the grounds of protecting public policy by reason of the fact that the activity is an affront to human dignity.

63 Ruth Nielsen, *op. cit.*, p. 96.

“Undertakings entrusted with the operation of services of general economic interest or having the character of a revenue-producing monopoly shall be subject to the rules contained in the Treaties, in particular to the rules on competition, in so far as the application of such rules does not obstruct the performance, in law or in fact, of the particular tasks assigned to them. The development of trade must not be affected to such an extent as would be contrary to the interests of the Union.”

Member states are free to determine which services they consider to be in the general interest. Some guiding constitutional principles are – as mentioned *supra* – included in Protocol No. 26 “On Services of General Interest”. The Protocol establishes some modifications to the general competition rules for such undertakings. The justification for the relaxation of the rules of competition law for services of general economic interest is that the goods or services provided are core activities, which a member state deems important to be provided locally, regionally or nationally.⁶⁴

The development of case law by the EUCJ and the praxis of the Commission have involved the proportionality test in the assessment of the use of national competences.⁶⁵ There are also some other principles governing the provision of services to users – especially principles on continuity of service, quality, security of supply, equal access, affordable prices, and social, cultural and environmental acceptability.

3.4 *Treaty Neutrality on Public Versus Private Law and on Ownership*

TFEU uses the terminology ‘public’ versus ‘private’, but does not contain an express distinction between public versus private institutions.⁶⁶ The use of the term ‘public’ in Article 36,⁶⁷ and in Article 45(3) TFEU,⁶⁸ and the use of the term ‘public undertakings’ in the context of the provision of services of general economic interest in Articles 14 and 106 TFEU, are relevant examples of the use of the term ‘public’ as something different from ‘private’. The traditional legal separation between public and private law is, however, not part of EU law.⁶⁹

64 Erika Szyszczak, *Controlling Dominance in European Markets*, Fordham International Law Journal, 2011, Vol. 33, issue 6, p. 1029-1127.

65 Constanze Semmelmann, *op. cit.*, p. 206.

66 Ruth Nielsen, *Towards an Interactive Comparative Method for Studying the Multi-Layered EU Legal Order*, in Ulla Neergaard and Ruth Nielsen (eds.), *European Legal Method – in a Multi-Level EU Legal Order*, 2012, p. 105-106; and Constanze Semmelmann, *op. cit.*, p. 200-206.

67 The modification to the prohibition of quantitative restrictions between member states laid down in Articles 34-35 is justified on the grounds of public morality, public policy or public security.

68 Concerning the justification of freedom of movement for workers on grounds of public policy, public security or public health.

69 Constanze Semmelmann, *op. cit.*, pp.195-196.

According to Article 345 TFEU, the EU is neutral on the question of public or private ownership. Member states are free to regulate ownership rights according to their national traditions. The EU can only impose limitations on the right to property in order to fulfil the objectives of the treaties. As an example, the right to property cannot impair the establishment and functioning of the internal energy market.

3.4.1 Difference between Energy and Water Services Competition Conditions

Both the energy and water areas include infrastructure dependency and the need to ensure public service obligations through network-based services.

Public intervention in the energy sector by means of regulatory power is designed on the one hand to ensure the existence of an internal energy market and, on the other, to ensure the public service obligations are met. The energy services are provided through the electricity and gas network-bound markets with the electricity grids and the natural gas in pipelines.⁷⁰ The energy infrastructure – electricity grid and gas pipeline network etc. – has the properties of a ‘natural monopoly’, and so they are viewed as regulated activities, while energy generation and supply are open to competition. The natural monopoly exists because of the cost of the infrastructure. To ensure competition for the market actors generating energy and for the market actors responsible for energy supply, EU energy policy is based on the general principle of a regime of regulated access to the electricity and gas infrastructure.

Water service infrastructure is also provided as a ‘natural monopoly’ due to water’s high sunk costs for abstraction, treatment, distribution and collection. The ‘natural monopoly’, water’s lack of physical homogeneity, the non-existence of a national and transnational water grid etc. require regulation to yield efficient allocation and use of water resources.⁷¹ Water services as public services embrace both the bodies providing the services and the general-interest services they provide, without regulated access to the infrastructure. Water services can be directly managed by the authorities responsible – regionally, nationally or locally – or delegated by them to a third party – a private or public water company;⁷² and it can also be handled as a public-private partnership. Ownership can be public or private – under public ownership, public authorities own all water assets and infrastructures. Under private ownership, private companies or individuals hold all rights over water assets and infrastructure.⁷³ Public ownership over water resources, infrastructure and the water assets has

70 Kim Talus, *Law-in-context: EU Energy Law*, in *Tidskrift utgivet av Juridiska Föreningen i Finland*, 2010, p. 519-523.

71 Mónica García Quesada, *op. cit.*, p. 20-28.

72 The concepts of ‘public service’ and ‘public sector’ are often – wrongly – confused. They differ in terms of functions, status, ownership, and clientele. Concerning the differences, see Mónica García Quesada, *op. cit.*, p. 51.

73 Mónica García Quesada, *op. cit.*, p. 51.

been the prevalent solution to the ‘natural monopoly’ of water and water services in most states. It is assumed that 95 % of water utilities in the world are publicly owned.⁷⁴ Privatized water is more common in Europe than on any other continent – though it still affects less than 30 % of the population.⁷⁵ The Directive on Services in the Internal Market⁷⁶ is based on neutrality on the question of public or private ownership. The Directive aims to create open internal market services, ensuring the quality of services provided to consumers/citizens in the EU, while also contributing to administrative and regulatory simplification and modernization. The Directive has *excluded* water supply and sewerage as subject to EU laws for mandatory competition and liberalization.⁷⁷ The European Parliament also – before this Directive came into force – stated in the “Green Paper on Services of General Interest” (2004) that liberalization of the water sector should not be subject to EU directives to liberalize it.⁷⁸ So, the EU is leaving it to its member states to make their own decisions with regard to incorporation of the private sector in the provisions of water services.⁷⁹

3.4.2 Public Procurement Obligations for Water and Energy Utilities

All public bodies and public undertakings over which public bodies may directly or indirectly exercise a dominant influence – by virtue of their ownership or financial participation, or the governing rules – and private undertakings operating on the basis of special or exclusive rights deriving from authorizations granted by a member state have to respect the Utilities Directive.⁸⁰ This Directive applies to public procurement contracts concluded in relation to supplies, services and works in energy services, and water utility

74 Mónica García Quesada, *op. cit.*, p. 23.

75 The European Federation of Public Services Unions, Water is a Human Right, food & water Europe, and Blue Planet Project, *Our Right to Water. Case studies on Austerity and Privatization in Europe*, 2013, p. 4.

76 *Cf.* the Directive 2006/123/EC on the service in the internal market in which it is stated that the Directive does not oblige member states to liberalise services of general interest or to privatise entities which provide such services (*cf.* the preamble recitation no. 8), and that the operators have the right to choose the legal form that they deem suitable for carrying out their activity (*cf.* the preamble recitation no. 38). It is also stated (in the preamble recitation no. 60) that the Directive should not interfere with the division of regional or local competences within the member states, including regional and local self-government.

77 See Article 16 of the Service Directive, and concerning this, see Mónica García Quesada, *op. cit.*, p. 65.

78 The same is the case in respect to the waste sector, *cf.* the Resolution of 13 January 2004, A5-0484/2003.

79 The Organization for Economic Co-operation and Development (OECD) and the World Bank support the involvement of the private sector. Concerning this, see Mónica García Quesada, *op. cit.*, p. 23-24.

80 Directive 2004/17/EC coordinating the procurement procedure of entities operating in the water, energy, transport and postal services sectors.

services. The Directive consequently regulates the contracts between public undertakings and third persons on energy-smart management by water utilities.

The Directive allows public undertakings to define targets for the usage of resources and negative environmental externalities, as, with reference to sustainability, it specifically addresses issues such as environmental management, energy and water consumption, and waste generation. As part of the procurement process, a competitive dialogue can be used to adopt a flexible procedure, which allows the undertaking to discuss the solution for a contract with the potential bidders before their tenders are submitted.

3.4.2.1. General competition conditions

Any act whereby a public body and public undertakings entrust the provision of services, as an economic activity, to a third party must be examined in light of the rules and over-riding principles of the TFEU and the judgments of the EUCJ. These principles are: equal treatment, transparency, non-discrimination, proportionality and mutual recognition.

The EUCJ has attempted to put the provision of “services of general interest” that are managed on a commercial footing by stating that where a transparent procurement process is not undertaken, the general EU criteria must be applied to ensure that undertakings that are delivering services of general economic interest are not over-subsidized and work in accordance with efficient principles.⁸¹

3.4.2.2 Contracts on public-private partnerships

The Utilities Directive must also be respected where a contracting authority intends to conclude a contract on public-private partnership (PPP) for pecuniary interest with a company legally distinct from it in whose capital it has a holding, together with at least one private undertaking.⁸² PPP is a relationship between the public sector and one or more private suppliers with the aim of funding and operating a joint venture.

There are no specific treaty rules or secondary EU law on the use of PPP in the water and energy sectors. The Commission adopted a “Green Paper on Public-Private Partnerships and Community Law on Public Contracts and Concessions” on 30 April 2004,⁸³ launching a debate on the need for legislative initiatives designed to regulate the procedure for awarding concessions. The paper discussed the special issues related to the criteria for ‘in-house relations’ in the Directive. It was stated with reference to case law that – as a rule – EU law on public contracts and concessions applies when a contracting body decides to entrust a task to a third party, i.e. a person legally distinct from it.⁸⁴

81 Erika Szyszczak, op. cit., p. 1766.

82 Communication on Public-Private Partnerships and Community Law on Public Procurement and Concessions, COM(2005) 569 final, p. 10.

83 COM(2004) 327 final.

84 The EUCJ has established that the position may only be otherwise where the local authority exercises over the person concerned a control similar to that which it exercises over its own departments and, at the same time, that the person carries out the essential part of its

3.5 *EU and National Power Regarding Regulated Energy and Water Services*

The principle of conferral is a fundamental principle of EU law stated in Articles 4(1) and 5(1)-(2) TEU and Article 4(1) TFEU. Under this principle, the EU is a union of member states, and those states voluntarily confer all their competences on it. Within the areas of energy-smart water utilities – combining environment, climate and energy issues – the TFEU contemplates in Article 4(2) the sharing of competences between member states and EU institutions.

3.5.1 Shared Competences

When competences are shared with the member states, both the Union and the member states may legislate and adopt legally binding acts. The EU institutions must satisfy two tests when they are regulating in such areas. *Firstly*, they must demonstrate that the objectives of the initiatives cannot be achieved sufficiently at the domestic level, and *secondly* they should demonstrate that the actual EU initiative, by reason of its scale or its effects, can be better achieved – for example, by being more effective, more democratic, more consistent with the internal market, more consistent with international obligations, and more environmentally friendly – at the EU level than at the national level (principle of necessity).⁸⁵ This means that when various forms of intervention are available to the Union, it must, where the effect is the same, opt for the approach that leaves the greatest freedom to member states and individuals. According to the principle of proportionality, each decision and measure has to be based on a fair balancing of the interests involved and a reasonable choice of necessary means.⁸⁶ The member states shall only exercise their competence to the extent that the EU has not exercised, or has decided not to exercise, its power.

activities with the controlling local authority or authorities, *cf.* Case C-107/98 *Teckal* and C-26/23 *Stadt Halle*.

85 Under the principle of subsidiarity, any action by the Union cannot go beyond what is necessary to achieve the objectives of the Treaties as stated in Article 5(2) TEU. The criterion is, however, not clearly defined in EU law. See Jan M. Smits, *Plurality of Sources in European Private Law, or: How to Live with Legal Diversity?*, in Ulla Neergaard and Ruth Nielsen (eds.) *European Legal Method – in a Multi-Level EU Legal Order*, 2012, p. 79.

86 Under the proportionality principle, the EU institutions' involvement in shared competences must be limited to what is necessary to achieve the objectives of the Treaties, *cf.* Article 5(3) TEU.

3.5.2 Guiding Principles on ‘Services of General Interest’

The guiding constitutional principles on how EU institutions and member states have to manage shared values when regulating water and energy services of general economic interest are stated in Protocol 26 “On Services of General Interest”⁸⁷ within the meaning of Article 14 TFEU. The regulators have to design the legal framework with respect to:

- the essential role and the wide discretion of national, regional and local authorities in providing, commissioning and organizing services of general economic interest as closely as possible to the needs of users;
- the diversity between various services of general economic interest and the differences in the needs and preferences of users that may result from different geographical, social or cultural situations;
- a high level of quality, safety and affordability, equal treatment and the promotion of universal access and of user rights.”

The Protocol, in other words, focuses on subsidiarity, sustainability,⁸⁸ flexibility and the public interest in its guidance regarding the policy on services of general interest – including water and energy services.

3.6 Prohibition of State Aid

Article 107(1) TFEU states that any aid granted by a member state or through state resources in any form whatsoever which distorts or threatens to distort competition by favouring certain undertakings is, so far as it affects inter-member state trade, incompatible with the internal market. Aid to facilitate the development of certain economic activities, where such aid does not adversely affect trading conditions to an extent contrary to the common interest may be compatible with the internal market, *cf.* Article 107(3)(c). The treaty rules on state aid law recognize that the antitrust rules may be modified/relaxed where a subsidy or other favourable treatment is given to a universal service obligation provider.⁸⁹ Article 14 TFEU⁹⁰ and Protocol no. 26⁹¹ regulate the special conditions for services of general interest. The funding of services of general economic interest, and the interaction with the above-mentioned procurement rules and state aid rules, are more important in case law than the interaction

87 Included in the Treaty of Lisbon as a part of the treaty rules.

88 Agenda 21, agreed as a global guiding principle at the UN Rio Conference on Environment and Development in June 1992, calls on the parties to delegate sustainable development responsibilities to the lowest level of public authority consistent with effective action.

89 Erika Szyszczak, *op. cit.*, p. 1764.

90 Mentioned above in part 3.2.

91 Mentioned above in the first sentence of part III.

between Articles 101 and 106 on the prohibition of a dominant position in the internal market.⁹²

The interplay between the TFEU's rules on completion and prohibition of state aid and the Community 2008 Guidelines on State Aid for Environmental Purposes⁹³ are important for the public funding of the transformation of water utilities into energy-smart water utilities. When assessing state aid cases, the Commission takes into account both the origin and the use of revenue in order to obtain a complete picture. The EUCJ has stated that the Commission must take into consideration all those factors which directly or indirectly may be involved – including indirect aid, the financing of the aid and the connection between the financing and the amount to be distributed as aid. Only aid which encourages environmental protection and resource efficiency at a higher level than the mandatory standards may benefit from public subsidies.

Furthermore, Article 110 TFEU aims at guaranteeing the neutrality of internal taxation by prohibiting discrimination against products of other member states and the protection of national products.

3.7 Harmonization of the Environmental, Climate and Energy Requirements

EU energy and water policies are both to be carried out in a spirit of solidarity between the member states and on the basis of the values and principles stated in the Treaty of Lisbon. The EU's secondary energy and water regulatory instruments described *infra* in part IV are based on one or more of the treaty rules.⁹⁴

3.7.1 An Internal Energy Market – no Internal Water Market

The competence of EU institutions in the area of the internal market ensures the prioritizing of the economic interests in a total harmonization of market conditions. Total harmonization is ensured by the use of Article 114 for secondary legislation.⁹⁵ When EU institutions use this legal basis, they must show that without the harmonizing measures, the functioning of the internal market would be endangered and competition distorted.⁹⁶ The 'New Approach'

92 Erika Szyszczak, *op. cit.*, p. 1744.

93 Community Guidelines on State Aid for the Environmental Protection, 2008/C82/01.

94 Some of the EU's secondary law on these issues ensures total harmonization intending to provide for a more or less uniform European standard from which it is no longer possible to deviate at the national level.

95 Jan H. Jans and Hans H.B. Vedder (eds.), *European Environmental Law*, 2012, p. 59-84.

96 The choice of harmonization level made by the EU institutions must be based on objective factors, which are amenable to judicial review and include, in particular, the aim and content of the measure.

(the modern legislative technique)⁹⁷ that is applied to various products and services with the use of privatized standardization decision-making on the ‘essential requirements’ is an important element in the EU’s secondary legislation on harmonization.

Environmental matters – such as water protection and utilisation – are regulated by Article 192 TFEU as the legal basis.⁹⁸ Article 193 TFEU expressly permits member states to take more stringent national environmental measures as long as they respect the requirements of the treaties. Harmonization measures in response to environmental protection requirements shall, where appropriate, also include a safeguard clause allowing member states to take provisional measures, for non-economic environmental reasons, subject to an EU inspection procedure. The secondary law on carbon trading (EU ETS), water, waste and industrial emissions mentioned *infra* in part 4.4., part 4.5., part 4.6. and part 4.7. are all based on the treaty’s environmental rules (now Article 192 TFEU).

The new legal basis for EU institutions in the Treaty of Lisbon with regard to energy responsibilities is Article 194(2) TFEU. The energy policy has to be designed in the context of the establishment and functioning of the internal market and with regard to the need to preserve and improve the environment, see Article 194(1). Energy law based on Article 194(2) – for example the new directive on energy efficiency, mentioned *infra* in part 4.3. – is not expressly described as minimum harmonization by the Treaty, as there are no references in Article 193 TFEU to Article 194.⁹⁹

The main rule is that EU institutions can only use a single legal basis when taking decisions in relation to new measures. However, the EUCJ does accept exceptional situations, where an act simultaneously pursues a number of objectives or has several components involved, without one being secondary and indirect in relation to the other. The EU energy law framework focuses on competitiveness (reasonable prices), a low-carbon future, and security of energy supply. The Directive on the Single Electricity Market (Electricity Directive),¹⁰⁰ the Directive on the Single Natural Gas Market (Gas Directive)¹⁰¹ and the regulations on access to the network for cross-border exchanges are *partly* based on the treaty rules on the internal market (now Article 114 TFEU), *partly* on other treaty rules.¹⁰² The Directive on Promotion

97 In 1985 the European Council adopted a Resolution on a ‘New Approach’ to technical harmonization and standards that is of importance for the legal sources regulating water and energy services today. The “New Approach” was introduced to ensure that voluntary standards were harmonised to avoid distortion to industry competition.

98 The environmental rule in the TFEU Article 192 is the legal basis for secondary legislation with a focus on the environment.

99 Christian Callies and Christian Hey, *Multilevel Energy Policy in the EU: Paving the Way for Renewables?*, in *Journal for European Environmental Law & Planning Law*, 2013, Volume 10, number 2, p. 94-100.

100 Directive 2009/72/EC concerning common rules for the internal market in electricity.

101 Directive 2009/73/EC concerning common rules for the internal market in natural gas.

102 The other treaty rules are Articles 155 and 156 of the Treaty Establishing the European Community (EEC), now Articles 155-156 TFEU on Trans-European Networks.

of Renewable Energy¹⁰³ is *partly* regulated on the basis of the internal market and partly on the environmental treaty rules (now Article 192). With regard to these directives, see *infra* in parts 4.1. and 4.2.

The aforementioned difference between the secondary legislation on water, which is minimum harmonized secondary legislation, and energy, which is total harmonized to a higher degree, is related to the ambition for the scope of the internal market. EU legislation has established the internal energy market – there is no internal water market.

3.7.2 No Veto Rights on Water and Energy Services and Technologies

Regarding environmental and energy policy, the Lisbon Treaty set out codecision as the main EU legislative procedure to carry out secondary legislation. This procedure is defined in Article 294 TFEU. There are, however, some exceptions in Articles 192(2) and 194(2)-(3) TFEU that ensure a veto right for each member state. Amongst the exceptions are all decisions affecting the quantitative management of water resources or affecting – directly or indirectly – the availability of those resources, and decisions that ‘significantly’¹⁰⁴ affect the conditions for exploiting the member state’s choice between energy sources and the general structure of its energy supply. Any decision on such issues must be adopted by a unanimous vote of the Council. The member states have consequently not delegated the competence to create a harmonized regulatory system for water and energy resources without acceptance from all states. Decisions on water and energy services and technologies of relevance to energy-smart water utilities are not included in the mentioned veto rights.

3.7.3 Different Form of Legislation with Consequences for National Implementation

The EU’s secondary legislation takes the form of regulations, directives and decisions. The use of these forms in the secondary legislation on water and energy is different. The use of regulation is more common in the energy sector compared with the water sector.

103 Directive 2009/28/EC. This Directive, as well as the Fuel Quality Directive (2009/30/EC), aims to ensure production of biofuels for use by vehicles in a sustainable way. Both directives set ambitious sustainability criteria for biofuels, and they ensure total harmonization of the sustainability criteria based on the Treaty rule on the Internal Market.

104 The term ‘*significantly*’ in Article 192(2)(c) means that the unanimous vote requirement only applies to final measures that affect the general structure of a member state’s energy supply, see Christian Callies and Christian Hey, *op. cit.*, p. 91.

EU regulations are immediately effective as ‘supranational’ on the national territory, without any additional measure, and the importance of national traditions on the national legislation will therefore lack specific importance.¹⁰⁵

The directives have to be implemented into national law on the basis of national traditions. The onus for the correct application of directives is primarily on the legislator, administration and judiciary of each member state.¹⁰⁶

Once the secondary legislation decided by the EU institutions is passed, the EUCJ and the Commission look over national shoulders to ensure that member states actually do what they commit to – using the EU law system as a means of enabling, enhancing, and compelling the behaviour of national governments and actors within member states to respond to concrete problems and challenges.¹⁰⁷ Based on the practice rulings of the EUCJ, member states are under an obligation to ensure, if necessary by a separate provision, that EU requirements take precedence in the event of conflicts, as the EU requirements have supremacy. The member states must ensure effective implementation of EU law at national level and, if necessary, establish effective, dissuasive and proportionate sanctions in order to implement and enforce EU law. Article 260 TFEU makes it possible to launch infringement proceedings against member states with financial sanctions.

3.8 *Cohesion Policy and Growth Initiatives*

As mentioned *supra*, the services of general interest can be managed both by public and by private actors. Regional and local authorities are important actors in water and energy service activities, as they have a special ability to work closely with citizens and stakeholders, building community awareness and implementing strong regional/local actions to reduce the negative consequences of urbanisation, to mitigate and to adapt to climate change.

The focusing on regional and local governance in the EU involves the cohesion policy that is established as part of the constitution in Article 3 TEU and Articles 174-178 TFEU. Beyond regulatory instruments, the EU also provides significant financial support linked to the climate change and sustainable energy, in particular through the cohesion policy, the EU Research Programmes, and in the future the Connected Europe Facility.¹⁰⁸ Within the cohesion policy, sustainable development has progressively gathered momentum, moving from a reactive to a proactive position.¹⁰⁹ Based on this policy, the EU institutions seek to achieve a more strategic approach to growth,

105 Article 288 TFEU.

106 Article 288 TFEU.

107 Anne-Marie and William Burke-White, *op. cit.*, p. 113-116.

108 *Green Paper A 2030 framework for climate and energy policies*, COM(2013) 169 final, p. 9. Climate action objectives – involving also resource efficiency, renewable energy and energy efficiency – will represent at least 20 % of EU spending in the period 2014-2020.

109 Ellen Margrethe Basse, *op. cit.*, p. 405.

simplification and decentralization by involving the regions and local players in the preparation of programmes.

4 EU Energy and Environmental Law

Based on Article 191 TEUF, EU policy on the environment (including energy and water) aims at a high level of environmental and human health protection. Union policy on the environment shall contribute to pursuit the objective of improving the quality of the environment, and prudent and rational utilisation of natural resources.¹¹⁰ The ‘precautionary principle’, the ‘principle that environmental damage should, as a priority, be rectified at the source’ (‘the source principle’), as well as the ‘polluter pays principle’ and the ‘principle that environmental conditions in the various regions’ must be taken into consideration are all guiding principles in the design of the relevant legislation for water utilities that wish to take part in the production of renewable energy, as the Directive on Renewable Energy, as well as the Water Framework Directive and other relevant environmental directives, have their legal basis in the environmental part of the treaty (now Article 192 TFEU), and the rules are minimum harmonised.

4.1 Internal Energy Market – with Focus on the Electricity and Gas Directives

The EU’s energy markets have been opened up to enable citizens to benefit from more reliable, competitive prices as well as more sustainable energy. The overall energy policy, “Energy Policy for Europe”, is currently the basis for the EU. It was adopted by the Council at its spring meeting held on 8-9 March 2007. It establishes “A Roadmap for renewable energy: Renewable Energy in the 21st century – the way to a more sustainable future”, and an Energy Technology Plan (SET Plan) with a focus on renewable energy technologies. The “Third Energy Package” includes a mix of obligations and recommendations for member states. These are related to the establishment of appropriate regulatory frameworks to enable increased efficiencies; market integration and security of energy supply; and support for research activities. Under this Package, renewable energy sources will face ‘priority dispatch’, meaning that, subject to security concerns, they should be dispatched ahead of other forms of generation, irrespective of the marginal cost. Among the most important secondary legislative acts are: the Directive on the Single Electricity Market (Electricity Directive);¹¹¹ the Directive on the Single Natural Gas

110 See Nicolas de Sadeleer, *The principle of a high level of environmental protection in EU law: policy principle or general principle of law?* in Gipperth & C. Zetterberg, *Miljörettsliga Perspektiv och Tankevänder. Vänbok till Jan Darpö & Gabriel Michanek*, 2013, p. 447-465.

111 Directive 2009/72/EC concerning common rules for the internal market in electricity.

Market (Gas Directive);¹¹² the regulations on access to the network for cross-border exchanges,¹¹³ and the Regulation on establishing an Agency for the Cooperation of Energy Regulators.¹¹⁴ The European Council of February 2011 set the deadline for completing the Internal Energy Market by 2014.

There is a general expectation in the EU that electricity will have to play a much greater role in 2050 than now¹¹⁵ – with consequences for energy security if the sources are wind and solar energy.

4.1.1 Ownership Unbundling and Competition Conditions

Both the Energy Directive and the Gas Directive contain rules on “ownership unbundling”. These are related to the opening up of the energy market to free competition and to the establishment of an internal energy market applicable to both public and private undertakings and the desire for ownership separation of assets. They define a series of activities as incompatible with each other. The infrastructure must be owned by a natural or legal person, separate at least in terms of its legal form from the system operator in whose systems the infrastructure is built (‘unbundling’). The public utilities on the market have to ensure the same competition situation for all enterprises. Their registered office in one member state must not have any consequences on the trading conditions in the other member states.

Under the Electricity Directive, distribution system operators are mainly responsible for ensuring the long-term capacity of the system in terms of distribution, operation, maintenance, development and environmental protection, and they are responsible for covering energy losses and maintaining reserve capacity.

The Gas Directive mainly concerns natural gas, liquefied natural gas (LNG), biogas, and gas from biomass (bioliquid). It regulates, for example, the injection of bio-methane from the energy-smart water utilities into the grid. Member states must ensure that all customers have the right to choose their gas supplier and to change supplier easily, with their operator’s assistance, within three weeks. On the basis of the Directive, they must also ensure the integration of national markets at one or more regional levels, as a first step towards the integration of a fully liberalised internal market.

112 Directive 2009/73/EC concerning common rules for the internal market in natural gas.

113 Regulation 715/2009 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.

114 Regulation 713/2009/EC.

115 Energy Roadmap 2050, COM(2011) 885/2, p. 6.

4.1.2 TSO Obligations on Grid Access and Prioritization of Renewables

Key to the internal energy market for electricity is access to the grid. The current electricity network in the EU was developed more than 30 years ago and is designed for one-way energy flows from large, centralized power plants to customers only.¹¹⁶ The infrastructure is essential for the internal energy market, and independent transmission system operators (TSOs) are responsible for operating, maintaining and developing the grid system. The independence must ensure a non-discriminatory dispatch of generators. The Electricity and Gas Directives obligate TSOs to invest to meet reasonable market demand for transmission in order to ensure the long-term ability of the system and to meet demand. Grid access for renewables may be prioritized by the TSOs. The Trans-European network (TEN-E) guidelines are also particularly relevant in terms of economic competitiveness.¹¹⁷

4.1.3 Smart Metering and Smart Grids

The EU regards smart meters and power grids as the keys to full exploitation of the potential for renewable energy and energy savings as well as improvements in energy services. Smart metering increases the information available to the customer.

The Electricity Directive requires member states to define an implementation of intelligent-metering systems in order to assist the active participation of consumers in the electricity supply market. In relation to electricity, and in accordance with the Directive, where the rollout of smart metering is assessed positively, at least 80 % of consumers should be equipped with intelligent metering systems by 2020.¹¹⁸ Given the close relationship between smart grids and intelligent metering, the ambition is to support the development of smart grids. The Commission has set up a “smart grid task force” to discuss the implementation of smart grids. In April 2011, the “Communication on smart grids”¹¹⁹ was adopted. Establishing a regulatory framework to provide incentives for smart grids is one of the five focus issues of this Communication.

In relation to biogas, and in accordance with the Gas Directive, where the rollout of intelligent metering systems is assessed positively, member states – and any competent authority they designate – should prepare a timetable for the implementation of intelligent metering systems.

116 World Energy Council, *Smart grids: best practice fundamentals for a modern energy system*, 2012, p. 8.

117 German Advisory Council on the Environment, *Pathways towards a 100 % renewable electricity system. Special report*, October 2011, p. 172.

118 Smart metering system or intelligent metering system means an electronic system that can measure energy consumption. They provide more information than a conventional meter and can transmit and receive data using a form of electronic communication.

119 COM(2011) 0202 final.

Both directives state that end customers must be properly informed of actual electricity/gas consumption and cost frequently enough to enable them to regulate their own consumption.

Such initiatives on smart metering and smart grids assist the active participation of consumers in the internal energy market – and make it possible for energy-smart water utilities to act as prosumers.

4.2 The Directive on Promotion of Renewable Energy

As mentioned *supra* in part 2.4, the EU has set itself the target for at least 20 % of the total energy used in 2020 to be based on renewable energy sources. The binding obligations are laid down in the Directive on Promotion of Renewable Energy (RED).¹²⁰ The Directive is applicable to all energy issues even when it overlaps with other areas of regulation. RED promotes energy from waste, landfill gas, water utilities, biofuels and biogas. It therefore encourages water utilities that wish to use hot water and sludge in the production of renewable energy. The holistic approach of the RED also involves the promotion of energy efficiency through building regulations and codes.

The Directive uses a legislative technique based on a co-regulatory approach that consists of defining mandatory essential requirements to ensure guarantees of origin,¹²¹ mandatory prioritized or guaranteed access to the grid for renewables¹²² and sustainable production of the biofuels used in the EU, while leaving the possibility of voluntary schemes and market-based measures etc. up to interested and knowledgeable parties. The guarantees of origin must be applied across energy sectors: electricity, heating and cooling.¹²³ Based on the sustainability criteria,¹²⁴ raw materials (biomass) for biofuel and bioliquid cannot be produced on land with high-carbon stock or on wetlands, forests, and areas with other wooded land of native species.¹²⁵ These mandatory sustainability criteria support the use of waste resources – including the waste resources produced and used by energy-smart water utilities. In order to stimulate the use of more sustainable types of waste materials for biofuel

120 Directive 2009/28/EC on the Promotion of Renewable Energy. The EU's calculation is based on final energy consumption as the expression of energy consumption by end users, exclusive of cross-border trade, and consumption for non-energy purposes. Distribution losses and own use in the production of electricity and district heating are added to this final energy consumption figure.

121 Article 15.

122 Article 16.

123 These provisions laid down in Articles 15-16 are also related to the third energy market package that came into force in March 2011, especially the rules on electricity grid connection.

124 The rules are laid down in Articles 17-19 of the RED.

125 These rules are partly non-retroactive to ensure some grandfathering by acceptance of existing activities for a period.

production, the contribution of such biofuels is counted by a factor of 2.¹²⁶ There is no common positive list of wastes and residues eligible for double counting and no harmonised implementation regarding control mechanisms, verification and documentation requirements.¹²⁷

Respecting these sustainability criteria is important for member states for the following purposes: calculating renewable energy targets under the Directive (related to final energy consumption); complying compliance with the quantitative renewable energy obligations; and receiving financial support for their consumption.¹²⁸

The RED is flexible with regard to the use of:

- tradeable green certificates that are cost-effective market-based tools;
- environmental subsidies, fixed price feed-in tariffs or as fixed-price premiums as economic instruments;
- eco-taxes as fiscal instruments;
- statutory rules on mandatory use of renewable energy;
- mechanisms that restructure traditional command-and-control rules.

The Directive accepts all types of joint projects between member states in renewable energy production and the use of renewable sources – and such cooperation may include private operators as well as public-private partnerships (PPP).

Many member states have decided to introduce mandatory green certificates. The basic premise of such schemes is that someone (the supplier, for example) has an obligation to maintain a certain percentage of renewables in their portfolio. This percentage can be achieved by generating more renewable energy, contracting an outside supplier to do so, or buying green certificates from a green electricity supplier. Low-cost suppliers will enter this market for green certificates.¹²⁹ Denmark has not decided to use this instrument, see *infra* part 5.4.4. In contrast with the instruments used in Denmark, see *infra* in part V, the certification systems are automatically creating a market price for renewables.

126 Article 21(2).

127 The volumes of advanced biofuels in the EU market are small. Only the Netherlands and the United Kingdom have significant amounts of double counting biofuels in the market, see *Bouble counting, half measures: Study of the effectiveness of double counting as a support for advanced biofuels* commissioned by ePURE and carried out by Meo Carbon Solutions.

128 Ellen Margrethe Basse, *The legal Design of Sustainability Criteria on Biofuels used by the European union*, in *Environmental Practice*, Cambridge Journal, available at “journals.cambridge.org/action/displayAbstract?fromPage=online&aid=8868718”.

129 Christiaan Vrolijk (ed.), *Climate Change and Power. Economic Instruments for European Electricity*, 2002, p. 57 and p. 91-92.

4.3 *The Energy Efficiency Directive*

The Energy Efficiency Directive¹³⁰ was passed after the Treaty of Lisbon came into force.¹³¹ It repeals the Directive on the Promotion of Cogeneration based on a Useful Heat Demand in the Single Energy Market, (CHP Directive),¹³² and the Directive on Energy End-use Efficiency and Energy Services.¹³³ It lays down measures to ensure that the EU achieves its headline target of using 20 % less energy by 2020 set by EU, see *supra* part 2.4. Each member state must set its target and present a national ‘energy efficiency action plan’ every 3 years, in 2014, 2017 and 2020. Energy companies covered by the Directive must achieve a cumulative end-use energy savings target by 2020. This target must be at least equivalent to achieving new savings, each year, from 2014 to 2020, of 1.5 % of annual energy sales to final customers, by volume, and averaged over the most recent three-year period before the Directive came into force.

Based on the Directive, public bodies (for example publicly owned water utilities) at national, regional and local level should fulfil an exemplary role as regards energy efficiency.¹³⁴ Energy-efficient purchasing decisions are also relevant with regard to the purchase of services – for example the services of energy and water utilities.¹³⁵

Member states should ensure that national energy regulatory authorities take an integrated approach encompassing potential savings in the energy supply and end-use sector.¹³⁶ To increase transparency for the end consumer to choose between electricity from cogeneration and electricity produced using other techniques, the origin of high-efficient cogeneration should be guaranteed on the basis of harmonized efficiency reference values.¹³⁷ Member states must require large companies to have an energy audit management system.

Energy-smart water utilities can reduce the input of non-renewable primary energy needed to supply one unit of delivered energy within a relevant system boundary and as such fulfil the conditions laid down in the Directive in respect to efficient individual heating and cooling.¹³⁸ The Directive therefore promotes energy-smart water utilities.

130 Directive 2012/27/EU on energy efficiency.

131 It follows the outline in the publication of the *Energy Efficiency Plan*, COM(2011) 109 final.

132 Known also as the Cogeneration Directive, and as the *CHP Directive* – 2004/8/EC.

133 Known also as the Energy Service Directive 2006/32/EC.

134 Preamble statement no. 15 of the Energy Efficiency Directive.

135 Preamble statement no. 19 of the Energy Efficiency Directive.

136 Preamble statement no. 45 of the Energy Efficiency Directive.

137 Preamble statement no. 39 of the Energy Efficiency Directive.

138 See the definition in Article 2, no. 43 of the Energy Efficiency Directive.

4.4 *The EU ETS Directive and the Proposed New Energy Tax Directive*

The EU's "Climate and Energy Package" from 2008/2009 is the most important 'internal' initiative and states that the EU must achieve at least a 20 % reduction in GHG emissions below 1990 levels by 2020, see *supra* part 2.4.¹³⁹ Each member state is subject to an individual, quantitative GHG emission reduction commitment set out in the EU's Emission Trading Directive (EU ETS)¹⁴⁰ and other commitments. The EU ETS establishes a 'cap-and-trade' scheme, making it mandatory for all member states to reduce CO₂ emissions from the sectors covered by the scheme. Conventional energy producers are included – water utilities are not. Energy entities within the EU are required to acquire CO₂ allowances entitling them to emit specified quantities of CO₂.¹⁴¹ CO₂ allowances are exchangeable, and may be bought and sold in all EU member states (the 'EU Bubble'). The prices for CO₂ allowances are determined by supply and demand. From 1 January 2013 auctioning is the basic principle of allocating allowances within the EU ETS.¹⁴² This means that EST businesses have to buy an increasing proportion of their allowances through auctions.

The EU has also set binding emission targets for non-ETS sectors. The effort-sharing agreement for the period 2013 to 2020¹⁴³ covers the entire EU with its 28 member states.¹⁴⁴ Based on this agreement, GHG emissions from non-ETS sectors must be reduced by an average of 10 % compared to 2005 levels by 2020. Combined with the reduction in EU ETS sector emissions and other elements of the "Climate and Energy Package", this is designed to ensure that the EU's goal of a 20 % reduction in GHG emissions across the entire economy is met before 2020, concerning this target see *supra* part 2.4.

The Energy Taxation Directive¹⁴⁵ sets a minimum level for member states' taxes on energy resources. The future design of the Directive is currently under

139 The EU is a party to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol. The Convention accepts the EU as a party acting together with its member states, *cf.* Article 1(6). Article 4 of the Protocol – which became known as the 'EU Bubble' – and allows the EU member states to meet their targets under the Protocol Annex B jointly through a differentiated commitment among them. One of the means used by the EU in the comprehensive package of measures is the market-based solutions established by the Kyoto Protocol.

140 Directive 2003/87/EC on the Scheme for Greenhouse Gas Emission Allowance Trading within the Community as amended several times.

141 One CO₂ allowance equals the right to emit one tonne of CO₂ within a year.

142 The EU ETS (as amended by Directive 2009/29/EC) covers the period from 1 January 2013 to 31 December 2020. The EU cap will reduce the number of available allowances by 1.74 per cent each year, delivering an overall reduction of 21 per cent below 2005 verified emissions by 2020.

143 Decision 406/2009/EC.

144 The first *Effort Sharing Decision* (Council Decision 2002/358/EC) only covered the emissions in the 15 old member states.

145 Directive 2003/96/EC restructuring the Community framework for the taxation of energy products and electricity.

discussion. The Commission published a proposal in April 2011¹⁴⁶ adding a CO₂ taxation chapter to the existing rules. The purpose is to implement the 20-20-20 targets of the “Climate and Energy Package” and to achieve better coordination between energy taxation and emissions trading. The proposed energy tax structure involves a single minimum rate for CO₂ emissions in relation to sectors not subject to the EU ETS. It is also the intention to introduce minimum tax rates for energy based on the energy content of fuel rather than on volume. It provides for higher minimum tax rates – particularly for heating fossil fuels – that are mandatory for member states.

The EU ETS, the existing Energy Tax Directive, and the proposed Energy Tax Directive promote the use of renewable energy sources as alternatives to fossil fuels through the use of market-based and fiscal instruments.

4.5 *The Water Framework Directive*

Water services are defined internationally as public goods¹⁴⁷ that have a social and economic value in all its competing uses, see Article 4 of the “Dublin Principles of Water”. These principles were accepted at the International Conference on Water and Environment in Dublin in 1992. The Water Framework Directive (WFD)¹⁴⁸ is – like the overall regulatory framework in the EU – based on these principles, and it integrates the economic aspect into the national obligations on the conditions for water services. Water services are defined in the WFD as all alterations to the basic characteristics of naturally available water and water that is rejected after each use. The WFD establishes binding rules and guiding principles based on the notions of sustainable development, integrated management of water resources, and environmental quality standards. Several daughter directives – including the Drinking Water Directive and the Urban Wastewater Directive – have to be implemented with respect for the principles of the WFD and supplement it. The general resource-efficiency policy is not explicitly mentioned in the WFD, as the Directive is from the period before the EU policy on resource efficiency came into force, but resource efficiency is mentioned in the Roadmap to a Resource Efficient Europe¹⁴⁹ and a European innovation partnership on water efficiency (EIP Water) was launched in December 2012.

146 COM(2011) 169/3.

147 See also *supra* in parts 3.2.-3.3.

148 Directive 2006/60/EC establishing a Framework for Community Action in the Field of Water Policy.

149 COM(2011) 571 final.

4.5.1 Full-cost Recovery for the ‘Public Services’ and the User Pays Principle

The WFD specifically mentions the use of water pricing.¹⁵⁰ The water price is defined as being the unit or overall amount paid by users for all the services that they receive in terms of water. In respect to the obligations on paying the costs of water services, the Directive distinguishes the services that are provided for water uses (that covers most human activities, including production of energy) from the activities between the natural water resources and the end uses. The WFD refers to the recovery of the full-cost prices for water uses (supply and wastewater collection and treatment) covering:

- (a) the supply cost – including the cost of investment, operation and maintenance, labour, administrative cost and other direct economic costs;
- (b) the resource cost – that represents the loss of profit due to the restriction on available water resources; and
- (c) the environmental cost – that represents the cost due to damage to environment and aquatic ecosystems caused by the water users and services.

Member states are allowed to grant some exemptions from the full-cost recovery principle based on justified social and environmental objectives, as well as for project development in regions entitled to EU Structural Funds as part of the cohesion policy. Developing an energy-smart water project could be just such a project.

The WFD’s underlying philosophy is that the cost of wastewater treatment should be transparent and that any failure to make water users responsible for the complete costs generated by their use is a source of water misallocation. The WFD also states that cross-subsidization between sectors should be avoided where this would create misallocation. Cross-subsidization between the energy and water sectors established *only* as a means to ensure promotion of renewable energy production, energy efficiency and resource efficiency is accepted.

150 The relevant Article is Article 9. Concerning this, see D. Assimacopoulos, *Recovery of full cost and pricing in the Water Framework Directive*, 2003, available at “www.environ.chemeng.ntua.gr/wsm/Uploads/Publications/Recovery”.

4.5.2 Environmental Protection and Quality Standards

The WFD embraces environmental aims to protect all bodies of surface water (watercourses, lakes and coastal waters) and groundwater, subdividing surface water into classes of ecological quality ('high', 'good', 'moderate' and 'bad'). It takes a holistic and 'combined approach' to water, with the river basins as the focal points.

4.5.2.1 *The Drinking Water Directive*

The Drinking Water Directive¹⁵¹ sets quality standards for water quality at tap (microbiological, chemical and organoleptic quality parameters) and the general obligations that drinking water quality must be wholesome and clean. The Directive obliges member states to monitor drinking water quality and to provide consumers with adequate and up-to-date information. Water utilities serving fewer than 50 persons and supplies that provide less than 10 m³ of drinking water per day on average can be exempt from the standards by the national authorities. They are allowed to include additional requirements e.g. regulating additional substances that are relevant within their territory, or can set higher standards, as it is a minimum harmonisation directive.

4.5.2.2 *Urban Wastewater Directive*

The Urban Wastewater Directive¹⁵² aims to protect surface inland waters and coastal waters by regulating the collection and treatment of urban wastewater and the discharge of certain biodegradable industrial water. Member states must establish monitoring of the performance of treatment plants and receiving water as well as of controls relating to sewage sludge disposal or re-use. The standards set by the Directive generally govern the appropriate treatment of wastewater. The nature of the required provision is dependent on the size of the agglomeration and the nature of the receiving waters. More advanced treatment is required for discharge to '*sensitive areas*'.¹⁵³ The Directive requires pre-authorisation of all discharges of urban wastewater, of discharges from the food-processing industry and of industrial discharges into urban wastewater collection.

151 Directive 98/83/EC.

152 Directive 91/271/EEC.

153 The sensitive areas are designated according to one or more of the following criteria: (a) water bodies which are found to be eutrophic or which may, in the near future, become eutrophic if protective action is not taken; (b) surface fresh water intended for the abstraction of drinking water and which could contain more than 50mg/l of nitrates if action is not taken; and (c) areas where further treatment is necessary to fulfil other directives.

4.5.3 Consequences of Legal Requirements on Energy use and GHG Emissions

As mentioned *supra* in part 1, the European Water Platform has indicated that the consequence of the water legislation is a higher carbon footprint. The need to meet stringent environmental standards and expectations from the WFD, the Drinking Water Directive and the Urban Wastewater Directive put pressure on the use of energy by water utilities. The consequences of the quality standards of the EU's water legislation – such as, for example, the advanced water treatment of sewage effluent described *supra* – has been estimated to result in energy use and GHG emissions quadrupling in the European Union by 2030.¹⁵⁴ At the national level, energy consumption in the UK's water sector has doubled since 1990 as a result of the EU water law due to the required additional treatment.¹⁵⁵

If energy-smart water utilities are supported, the use of the water utilities' own renewable energy may be a useful means to stop the negative development in respect to the use of energy from fossil energy and the resultant impact on carbon footprint.

4.6 *The Waste Framework Directive*

The Waste Framework Directive¹⁵⁶ (WFD) has established a waste hierarchy, as it calls on the member states to take the necessary measures to ensure that waste is prevented, re-used, recycled or utilized as renewable energy sources or, as the last resort, disposed of without environmental or health risks.

Member states may deviate from the waste hierarchy if justified by life-cycle thinking.¹⁵⁷ The WFD has established the concept of waste to encourage a life-cycle approach, for example by clarifying the distinction between waste and 'by-products' and introducing 'end-of-waste criteria', clarifying when waste is handled in a manner that makes it a product. If, for example, an energy-smart water utility is producing biogas for use in combined heat and power plants (CHP), or is injecting bio-methane (processed biogas) into the natural gas grid, the biogas and bio-methane will no longer have the character of waste. The Directive therefore promotes energy-smart water utilities.

154 Martin Cave, *Independent Review of Competition and Innovation in Water Markets: Final report*, April 2009, p. 17 with references to UK Water Industry Research: A review of treatment technologies and the impact on climate change, 2002. Further increases in GHG emissions are likely, resulting from pollution displacement from water bodies to the atmosphere.

155 The European Water Platform, op. cit. report from 2011, p. 10-11.

156 Directive 2008/98/EC.

157 The basic element in life-cycle thinking is the recognition that all raw materials used in production and all consumption goods finally end up in the environment and are therefore potential pollution sources.

4.6.1 Full-cost Recovery Prices and the Polluter Pays Principle

The operators directly responsible for the provision of waste management facilities and services are obliged to move towards a position where their services recover the full costs of the services provided, as the WFD is based on the ‘polluter pays principle’. If waste treatment results in a product – for example biogas – that can be sold, a reduced price for the management is justified.

4.6.2 The Sludge Directive – and the Draft on Future Rules

Several daughter directives – including the Sewage Sludge Directive¹⁵⁸ – respect and supplement the general waste management legislation laid down in the WFD. The Sewage Sludge Directive requires member states to apply maximum limit values for certain metals, both in the sewage sludge and in the soil to which the sludge from the water utilities is applied, to pre-treat sludge, and to restrict its use on certain soils. The main aims of the Directive are to regulate the use of sewage sludge in agriculture in order to prevent harmful effects on soil, vegetation, animals and humans, and to encourage the correct use of sewage sludge from water utilities. An initiative on compost standards based on end-of-waste criteria and quality standards for applying compost through a revision of the Directive¹⁵⁹ is an important step forward in waste resource policy. Such quality standards can promote energy-smart water utilities.

4.7 The Industrial Emission Directive

The Industrial Emission Directive (IED)¹⁶⁰ lays down the principles governing the procedures and conditions for the granting of operating licences to construct and operate large industrial installations. It applies to specified installations, defined as stationary technical units, in which one of the activities listed in Annex I to the IED is carried out and any other directly associated and technically connected activities. The Directive is based on the ‘integrated approach’, ensuring a holistic assessment of all environmental aspects of the polluting activities.

4.7.1 Conventional Energy Production is Included

The IED covers combustion of fuel in installations with a rated thermal input at 50 MW and above. New activities have been included in the scope of the IED –

158 Directive 86/278/EC.

159 Directive 86/278/EC

160 Directive 2010/75/EU on industrial emissions (integrated pollution prevention and control) (recast).

for example waste disposal and recovery activities of non-hazardous waste. The IED continues the requirements of the former IPPC Directive¹⁶¹ in respect of waste minimization and energy efficiency among the criteria for determining the Best Available Techniques (BAT)¹⁶² that should serve as a reference for setting the permit conditions for installations within its scope. The operator applying for a licence must demonstrate to the satisfaction of the authority, during the licensing process, that the installation/facility will be operated in such a way that all the appropriate preventative measures are taken against pollution through: (a) the application of BAT, (b) the environmental quality standards are met, (c) the quality standard for the recipient is not breached, and (d) monitoring and reporting is carried out within a quality-assurance regime by an accredited actor. Applicable emission limits are provided through the directives on water, waste, ambient air quality, noise etc. According to Article 11(e), the generation of waste is to be prevented; if waste is generated, the waste hierarchy of the WFD has to be applied. The IED promotes resource efficiency, energy efficiency¹⁶³ and the use of renewable energy.

4.7.2 Energy-smart Water Utilities are not Included

It follows from Annex I no. 6.11 of the IED that only independently operated treatment of wastewater *not covered* by the Urban Wastewater Treatment Directive¹⁶⁴ and discharge of wastewater from an installation covered by Chapter II of the IED have to follow the rules of the IED.

Where a slurry store is enclosed and the gas it naturally produces is harnessed and burned to produce heat and power energy, it is not considered a fuel manufactured from waste. The biogas burner does not require an environmental permit under the IED unless it has a net rated thermal input of 50 MW or more.

Water utilities taking care of ‘services of general interest’ are consequently not regulated by the IED.

4.8 Summing up on the Holistic Approach

The picture of EU legislation shows a puzzling case of co-ordination in the legislation – but not as badly coordinated as indicated in the European Water Platform’s report, see *supra* part 1. The picture of the regulatory framework shows that traditional ‘silo thinking’ has been replaced by a more holistic approach. For example, in the interest of legal certainty for the energy sector,

161 Directive 96/61/EC (Directive 2008/1/EC).

162 The roles of the BREFs – and the BAT conclusions – for environmental performance have been strengthened by the IED.

163 When reporting under the Directive, member states shall include information on the energy efficiency levels of installations undertaking the combustion of fuels.

164 Directive 91/271/EEC.

the definitions used in the Renewable Energy Directive are harmonised with the definitions introduced by the Electricity Directive, and such harmonization of the terms used can also be found in several of the other directives just mentioned. The interplay between instruments that support the utilization of waste resources and ensure savings in the use of fossil fuels with a focus on the life-cycle-wide environmental impact (LCA), avoiding unnecessary resource use, is an important aspect in most of the directives that are based on the concept of resource efficiency. The use of economic principles in several of the above-mentioned directives, the acceptance of flexibility¹⁶⁵ and the ‘technology neutral’ approach – for example in the RED – are all important aspects in the design of the regulatory instruments that promote interest in energy-smart water utilities.

The conditions set by the Danish legislator – and the traditions behind them – will be described in the next part.

5 Danish Legislation, Institutions and Traditions

Denmark is an EU member state – it became a member along with the United Kingdom and Ireland in 1973.¹⁶⁶ The Danish legal system falls within the Scandinavian legal family, which does not fit perfectly into either the civil law traditions or the common law system. The mixture of statutory and case law, as well as the role of the courts (which lack normative competences), is characteristic of the Scandinavian legal family.

5.1 *The old Constitution and the Administrative Principles*

The Danish monarchy is based on a written constitution, the history of which dates back to 1849. The Constitution has been amended only rarely since then. Section 3 of the Constitution states that the legislative power shall be jointly vested in the King (the Government) and the Parliament, while the executive power shall be vested in the King (the Government). The Constitution has not been amended since 1954. It is not based on the concept of sustainability, and it does not mention the principle of integration or any other environmental principles. The Danish notion of the environmental principles is that they are only political signals to the administrative authorities, and interest in the principles is not very strong in terms of legal decision-making. One of the problems with implementation of the principles is that the ‘polluter pays

165 See the Communication on Security of Energy Supply and International Cooperation, COM(2011) 539 and on the “Energy Roadmap 2050”, COM(2011) 885/2.

166 Act No. 447 of 11 October 1972 on Denmark’s accession to the European Economic Community (EEC) contains the necessary provisions for the transfer of constitutional authority to the EU institutions on the basis of Section 20 of the Danish Constitution.

principle' applies in praxis primarily to households and, to a lesser extent, industry.¹⁶⁷

The fact that ministers, according to the Constitution, are politically answerable to Parliament implies a measure of cohesion between the legislature and the ministries. Today, Danish environmental and energy law is strongly rooted in administrative law. Danish unwritten administrative law is an important part of this law. It became established as a special judicial discipline in 1924, with a doctoral thesis by Professor Poul Andersen, who introduced the theory of French administrative law.

Command-and-control regulation and the use of traditional public law and municipal law principles have been the traditional way of dealing with services of general interest.

As a result, Danish administration is relatively centralised, and the separation of powers principle – the principle of specialisation as part of administrative law – functions as a barrier to the holistic approach laid down in the concept of sustainability and the principle of integration – and it is also a barrier to co-ordination between the relevant authorities. In the assessment of the conditions for energy-smart water utilities, there are three ministries involved:

- The Ministry for the Environment is the relevant central water authority. The administration by this ministry is carried out by two agencies: the National Environmental Protection Agency (EPA) and the National Nature Agency.
- The Ministry of Climate, Energy and Buildings – with its special agencies, the Energy Agency and the Danish Energy Regulatory Authority, as well as its non-profit company, Energinet.dk (the national system operator) – has the power in respect to sectorial legislation on energy of relevance for the energy smart water utilities.
- The Ministry of Business and Growth has competences in the area of competition, the price control of the water utilities and on public-private relationships. The Competition and Consumer Authority regulates the prices of services provided by publicly owned water utilities. This agency comes under the auspices of the Ministry of Business and Growth as part of the Danish competition authorities.¹⁶⁸

These three ministries have a staff of administratively and technically trained personnel: law graduates, economists, engineers specialised in different branches, chemists, doctors, biologists etc. Within their particular fields, the agencies advise the minister, they advise municipalities, and provide guidance and information services to the public, the business community etc. using their sector-specific approaches.

167 OECD *Environmental Performance Reviews. Denmark. 2007*, p.17.

168 Eva Moll Sørensen. *The Water Sector Reform – Economic Efficiency and Central-Local Relations*, AKF Working Paper, 2010, p. 23-25.

As declared by Section 82 of the Constitution, the municipalities and the regional councils are in a relatively independent position. The Parliament empowers the Government to take responsibility for the control of the municipalities' and regional councils' implementation of the legislation.

5.2 *The Municipalities and their Conditions for Investments*

Under the Environmental Protection Act and several other environmental acts of relevance for water utilities, the main responsibility for public power and administration of environmental protection rests with the 98 municipal councils. This focusing on local governance is in harmony with the cohesion policy that is established as part of the constitution in Article 3 TEU and Articles 174-178 TFEU.¹⁶⁹ The municipalities also have public power on the regulation of heating services. They have no public power in relation to electricity production.

It is normal to establish municipally owned enterprises as well as joint municipal companies to take care of water, waste and heating supply services, thereby separating the administrative power – which has to remain within the municipality authority – from the services.

As roughly 70 % of all Danish governmental spending is consumed at local governmental level, the framework determining incentives for local government to carry out long-term investments – for example in energy-smart water utilities – is crucial. This regulatory framework is, however, failing to provide sound incentives.¹⁷⁰ The municipality's investments are regulated by a 'pay-as-you-go' financial system, under which each year's expenditure must be financed out of the current revenue. Investment in water utilities by taking on debt is also restricted. As regards loans for projects, the municipality is obligated to deposit funds equal to the full project investment costs upfront under the Statutory Order on Municipality Loans.¹⁷¹

5.3 *40-year-old Legal Design and Political Agreements*

The OECD has stressed that there is a need to develop a long-term, comprehensive Danish environmental plan or framework with specific objectives, including targets and deadlines.¹⁷² Denmark's environmental efforts are by OECD characterized as scattered across a large number of unrelated programmes, policies and ministries. The current environmental and energy legislation was designed in the 1970s. The most important part was the first

169 See *supra* part 3.8.

170 Anders Eldrup and Peter Schütze, *Organization and financing of public infrastructure projects. A part to economic growth and development of the Danish welfare model*, Public-Private Partnerships, 15 May 2013, p. 12.

171 Statutory Order No. 68 of 1 January 2013.

172 *OECD Environmental Performance Reviews. Denmark. 2007*, p. 122f. and p. 137.

Environmental Protection Act, which came into force on 1 October 1974. The primary objectives of the Act were to establish environmental regulations based on considerations of hygiene and ecological balance, to prevent and combat the pollution of air, water and soil through the use of end-of-line technologies, to stress protection of nature and the environment as a factor in its own right, and to prevent and combat noise nuisance, as well as to provide the necessary administrative basis for the planning and implementation of pollution control. In 1991/1992 the Parliament passed a reform that was not very revolutionary, but it ensured a reduction in the number of acts. The current environmental law that consist on many acts and statutory order is to some extent the result of EU law, as well as international conventions and declarations.

The Danish electricity system is heavily dependent on coal, while also employing a large share of CHP. Renewable energy is increasingly contributing to the country's energy supply. It accounts in 2013 for about 22 % of actual energy consumption and 25 % of electricity consumption. The promotion of renewable energy as part of the energy sources was triggered by the first energy crisis that occurred in 1973. The first Danish energy action plan was published in 1976. The energy plan led to significant debate about the alternatives to oil.¹⁷³ Several instruments were introduced, including an energy tax for households,¹⁷⁴ An Act on Energy Policy Measures¹⁷⁵ and an Act on Electricity Supply¹⁷⁶ were passed in 1976. Electricity supply was, at that time, a state monopoly. An Act on Subsidies for Electricity Production was passed in December 1991.¹⁷⁷ It secured a guaranteed price for electricity produced by the use of renewable sources. The guaranteed prices (feed-in tariff) were subsidies per kWh delivered to the grid, paid to independent producers as a supplement to the market price. The feed-in tariff was fixed at 85 % of the distribution companies' production and distribution costs. On top of the feed-in tariff from the utilities, private wind power producers received a subsidy.¹⁷⁸ The Danish approach to renewable energy sources was, in other words, not technology neutral – and it is still not technology neutral.

173 Niels I. Meyer, *Learning from Wind Energy Policy in the EU: Lessons from Denmark, Sweden and Spain*, p. 348.

174 The scheme lasted until 2002. It is mentioned on p. 7 and p. 21 in DEA, Eltra and Elkraft *Solar cells. Launching a national strategy for research, development and demonstration, 2002/2003* (hereinafter the DEA's solar strategy).

175 Act No. 194 of 28 April 1976.

176 Act No. 54 of 25 February 1976.

177 Act No. 944 of 27 December 1991. It was the Minister of Taxation that had the power to decide when these rules were to come into force.

178 Articles 2 and 3 of the Act No. 944 of 27 December 1991 on Subsidies for Electricity Production, Niels I. Meyer, *Learning from Wind Energy Policy in the EU: Lessons from Denmark, Sweden and Spain*, European Environment, p. 351; and the Union of the Electricity Industry (eurelectric), *Market Mechanisms for Supporting Renewable Energies: Tradable RES Certificates*, June 2001, Annex 2, p. 19.

An obligation for the energy companies to make holistic plans covering both the energy resources to be used and incentives for energy efficiency was passed as an amendment to the Electricity Supply Act in 1994.¹⁷⁹ A third energy action plan, “Energy 21”, was presented in 1996. The objective was that 50 % of electricity consumption in 2030 would be covered by wind power. The obligation for energy companies to support environmentally friendly energy production was included in the Act in 1996. An “Electricity Reform Agreement” between the political parties in the Parliament of 3 March 1999 created part of the framework for the implementation of the first Electricity Market Directive.¹⁸⁰ The Act aimed in particular to promote sustainable energy use, including energy saving, use of CHP, and renewable and environmentally friendly energy sources. The ambition was to ensure that 20 % of electricity would be based on renewable sources in 2003. The detailed provisions on the settlement price for electricity from such sources, including issues of green certificates,¹⁸¹ determination of the consumer purchase obligations, and the Renewable Energy Source Fund, were part of the agreement. Rules obliging all electricity consumers to purchase electricity from renewable sources were included in the agreement.¹⁸² At that time 10 % of electricity production was already based on renewable sources.¹⁸³

The 2004 political “Agreement on Energy Settlement” between the political parties established a new market-oriented pricing mechanism for wind power.¹⁸⁴ The former Government presented “A Visionary Danish Energy Policy 2025” on 19 January 2007. The strategy stated¹⁸⁵ that “in Denmark, the primary sources of renewable energy are wind and biomass.” The political debate on the Government’s action plan resulted in a broadly based “Energy Agreement for Danish Energy Policy” between the political parties in the Parliament on 21 February 2008, covering the period 2008-2011. The 2012 Danish Political Energy Agreement, “Accelerating Green Energy towards 2020”, sets the targets for 2020 to include approximately 50 % of electricity consumption supplied by wind power, and more than 35 % of final energy consumption supplied from renewable energy sources. The Energy Agreement includes economic initiatives on wind energy, biogas, biomass and solar energy. An agreement between the Minister for Climate, Energy and Building and the grid distributing companies established in November 2012 doubles

179 Act No. 95 of 9 February 1994 on amendment of the Energy Supply Act (“integrated resource based planning of the supply of electricity”).

180 R.P.J.M. Raven and K.H. Gregersen, *Biogas plants in Denmark: successes and setbacks*, in *Renewable & Sustainable Energy Reviews*, 2005, p. 10.

181 The Danish Energy Agency, *The Green Certificate in Denmark. Status and implementation*, October 2001, p. 6.

182 Act No. 375 of 2 June 1999.

183 Explained in the general comments following the Act.

184 Act No. 205 of 29 March 2004 and Act No. 494 of 9 April 2004 amending the Heat Supply Act, and the interpretation of these amendments by the Energy Appeal Board by decision of 18 May 2005, J.No. 21-301.

185 Citation from *A visionary Danish energy policy 2025*, p. 5.

energy savings. In May 2013, the Government presented the “Smart Grid Strategy. The intelligent energy system of the future”. An important aspect of the strategy is that the smart grid must extend beyond the electricity system, thereby ensuring that energy-smart water utilities are one of the possible future actors contributing to the fulfilment of the strategy.

5.4 Electricity Production

The Electricity Act prescribes a duty to seek a permit from the Minister for construction of and substantial changes to energy power plants. Only enterprises that have been licensed by the Energy Agency (under the Ministry for the Climate, Energy and Buildings) may produce electricity at installations with a capacity of more than 25 MW. If such a facility is a CHP plant with a capacity above 25 MW, it has to be approved both in accordance with the just mentioned Act¹⁸⁶ and in accordance with the Environmental Protection Act¹⁸⁷ that is administrated by the National Environmental Protection Agency (under the Ministry for the Environment).

Permits are only issued if applicants are able to document that they fulfil specific, published conditions concerning energy efficiency, fuel use and environmental management.

The requirement for a prior permit under the Electricity Act does not apply to smaller facilities.¹⁸⁸ Renewable energy facilities with a capacity of 10 MW or less are not obligated to apply for a permit. This is a more favourable situation for production based on renewable sources compared with traditional fossil-based plants; traditional plants have to apply for a permit if they have a capacity of 5 MW or above.

5.4.1 Centralised Price Regulation, Benchmarking, PSO and Feed-in Tariffs

With the above-mentioned 1999 electricity reform, a new centralised price system was introduced to replace the former cost-based pricing system to ensure the implementation of the first version of the EU internal energy market. Benchmarking was applied as incentives for the producers. Benchmarking involves systematic comparisons of performance and processes based on measurements that are used in the energy sector as a tool for identifying the potential for increasing efficiency. It is constructed as a revenue cap for each operator based on the expected performance improvements for the electricity sector, with an individual cap reflecting the relative inefficiency of the operator. The Danish Energy Regulatory Authority has established as the

186 This Act is partly an implementation of the Electricity Directive.

187 This Act is partly an implementation of the IPPC Directive and the new IE Directive.

188 Statutory Order No. 493 of 12 June 2003 on the conditions and procedures for the administration of the licence system.

competent authority with regard to both the benchmarking and the estimation of consumer pricing.

The price system – still in force – does not contain a financial incentive for consumers to respond to price signals. Consumers are primarily regarded as ‘passive’ consumers with predictable and regular consumption patterns. As mentioned *infra* in part 5.4.2. there are also several Danish energy taxes, and the tax level is high.

Feed-in tariffs have been used since the first electricity liberalisation reform (1999) as a support system for renewable energy. The producers of environmentally friendly energy and renewable energy receive different levels of supplement price. The system is a combination of: (a) a fixed premium subsidy price added to the market price, and (b) a fixed feed-in tariff for electricity. The supplement prices depend on the content of the political agreements and the technology.¹⁸⁹ A new Act on Renewable Energy¹⁹⁰ was passed in 2009 as a result of the “Energy Agreement” of February 2008. In principle it covers all kinds of renewable electricity based on the description of the aim of the Act. However, it first and foremost promotes wind energy. The conditions for environmentally friendly energy production (for example the use of waste and biomass as sources) are set out in the Electricity Act.¹⁹¹ The fixed price is combined with a purchase obligation for the system operator. Energinet.dk administers the feed-in tariff system. All electricity consumers have to contribute to this subsidy system under the Public Service Obligations (PSO) system. The administration is the responsibility of Energinet.dk. In 2010, total expenses for PSO were DKK 2.5 billion.¹⁹²

5.4.2 Energy Taxes

Denmark makes use of many energy taxes. The balance of taxation among the various economic sectors is uneven: thus, household energy taxes and taxes on the service sector are considerably higher than those levied on industry, as industry is often provided with exemptions or opportunities for rebates to protect international competitiveness.¹⁹³

In 1994 a tax reform, named the “CO₂ Package”, increased the energy taxes on coal and coal-based electricity. The energy tax on trade and industry was revised in 1995. Under this reform, a green tax on energy consumption by trade and industry was phased in during the period 1996-2000. The package introduced higher CO₂ taxes, energy taxes on space heating, a gas tax on natural and town gas and SO₂ taxes on emissions for trade and industry.

189 R.P.J.M. Raven and K.H. Gregersen, *Biogas plants in Denmark: successes and setbacks*, in *Renewable & Sustainable Energy Reviews*, 2005, p. 11ff.

190 Act No. 1392 of 27 December 2008.

191 Ellen Margrethe Basse, *Renewable energy – the legal framework* (in Danish), p. 248ff.

192 Danish Energy Agency *Energy Statistics 2010*, p. 45.

193 OECD *Environmental Performance Reviews Denmark. 2007*, p. 127.

As part of the implementation of the EU ETS in 2005,¹⁹⁴ a decision was taken by the Danish Parliament to pay back the CO₂ taxes paid for fuels and heating used in ETS sectors to the operators. The EU did not accept this system. In non-ETS industries (i.e. services and industries not covered by the ETS quota system) there is now a deduction scheme reducing payment of CO₂ taxes for energy-intensive industries. This was established in order to secure equal treatment of similar industries in the ETS and non-ETS sectors after the Commission did not accept the Danish exemption of the ETS sector from the CO₂ taxes, and the ETS sectors were taxed at the minimum level established by the Energy Taxation Directive. The deduction scheme is removed simultaneously with the introduction of auctioned quotas, starting from 2013. There are no energy-related taxes on bioenergy. In contrast, bioenergy is included in the objectives covered by CO₂ taxes, NO_x taxes and CH₄ taxes.

The Danish Economic Councils recommended a change to the system in their 2009 Yearly Report. In October 2009 a new political agreement was reached on better integration of wind energy in the electricity supply system. The agreement reflected changes in taxes. The results of the agreement were also two reports published in June 2010: one prepared by the Ministry of Taxation on dynamic taxes¹⁹⁵ and another prepared by the Ministry of Climate and Energy on dynamic tariffs¹⁹⁶ to ensure the integration of renewable energy sources (mainly wind) into the electricity supply system. The Ministry of Taxation concludes that low-carbon energy production is not enhanced by the Danish tax system.¹⁹⁷ It states that the existing general tax on energy laid down in the Electricity Tax Act is, in its current form, neither targeted to raise public revenue efficiently nor to address environmental externalities or concerns about security of energy supplies. In their 2010 Report the Danish Economic Councils concluded that a new system based on the polluter pays principle was preferable, as:¹⁹⁸

“A high and fairly stable emission price will, in itself, provide an incentive to switch to renewable energy and develop new technologies...”

194 The most important is the EU emission trading schemes (EU ETS), based on the Emission Trading Directive (2003/87/EC), see *supra* part 4.4.

195 The Treasury Department, *Statement on the opportunities and impacts of changing taxes on electricity with special emphasis on better integration of renewable energy (dynamic taxes)*, May 2010. (Referred to subsequently as the statement by the Ministry of Taxation “Statement on dynamic taxes”).

196 Danish Climate and Energy Ministry, *Presentation of opportunities for and the effects of dynamic tariffs for electricity* (in Danish), June 2010 (hereinafter referred to as the Climate and Energy Ministry’s “Statement on dynamic tariffs”).

197 The allowances are allocated free of charge until 2013. The quota price to be paid for energy production based on fossil fuels, if producing more than provided by the allocation of allowances, is currently (May 21, 2010) ca. DKK 90/kWh, *cf.* the Ministry’s statement on the dynamic of taxes, p. 71ff.

198 The citation is from the 2010 Yearly Report on p. 479.

5.4.3 Guarantee of Origin

As stated above, it is mandatory for the EU member states to introduce a guarantee of origin system for renewable energy sources.¹⁹⁹ The European Energy Certification System (EECS) framework is designed to give users confidence in this system, and the quality and method of energy output. It provides an accounting mechanism for renewable energy on the basis of certificate systems. The Danish ‘Energinet.dk’ is responsible for the operation of the EECS RECS system in Denmark.²⁰⁰ The system is laid down in a statutory order.²⁰¹

5.4.4 Green Certificates are Not Used in Denmark

As mentioned *supra* in part 5.3., according to the Electricity Act as it was formulated in 1999, all electricity consumers would be under an obligation to purchase green certificates.²⁰² The obligation to purchase an increasing share of renewable sources as part of the energy supply system was set forth in Chapter 9 of the Act. The Act ensured priority and guaranteed access for electricity from renewable sources and for energy produced at CHP. Renewable energy capacity investors could have green certificates, which the consumers were under obligation to buy. Based on this scheme, producers would receive a total income consisting of the market price for electricity plus the sale price of the green certificate. The minimum price for a green certificate was specified as the same price as the former state aid (electricity production subsidy) established by the Act on Subsidies for Electricity Production until 1999.²⁰³ Tradable certificates for renewable energy from new wind turbines were planned to be issued from the start (2001/2002). A special Renewable Energy Fund was established to act as the buyer of the green certificates. The certificate scheme was notified to the EU Commission.²⁰⁴ At that time it was assumed that the EU would introduce a market-based support scheme as part of the first Renewable Energy Directive.²⁰⁵ The green certificates were, however, not included in this Directive.

In September 2002, the former liberal-conservative Danish Government presented new initiatives on cost-effectiveness and liberalization of the markets described in “Liberalization of the energy markets – The Government’s Growth Strategy”. The strategy states that:²⁰⁶

“Today, there is an obligation to purchase electricity produced by decentralised combined heat and power (CHP) plants and wind turbines. This means that consumers cannot make their own choice of supplier for about 40 % of electricity consumption. This purchase obligation must be replaced by subsidies financed through the electricity bill. In this way, all

199 See Article 15 of the RED.

200 The EU obligations were implemented in Denmark by means of Statutory Order No. 1323 of 30 November 2010.

201 Statutory Order no. 1323 of 30. November 2010.

electricity producers will be exposed to competition and, at the same time, due account is taken to the environment and to the protection of district heating consumers.”

A number of complications related to the operational principles of the renewable electricity market system, including the transaction costs in a small national system, were the reasoning behind the political decision.²⁰⁷ The Danish consumers’ obligations to purchase electricity from renewable energy (the RES-E market)²⁰⁸ were phased out of the Electricity Supply Act in December 2002.²⁰⁹ The support to renewable energy was remodelled as feed-in tariffs established in the Electricity Act, corresponding to the CO₂ tax on electricity.²¹⁰

5.5 *Relations between Renewable Energy and Smart Grids*

Coverage by intermittent wind power of more than 50 % of electricity consumption in the near future – in accordance with the 2012 Danish Political Energy Agreement, see *supra* part 5.3. – gives rise to regulatory problems, especially in combination with a high percentage of heat-bound cogeneration. More electricity from wind will require additional investment in infrastructure, including transmission networks.

The biggest challenge is that private as well as public actors must make a number of investments. Public-private partnerships (PPP) are among the possible solutions. Another challenge is the future complex energy system needs information and global standards. A Roadmap from 2010, “Smart Grid in Denmark”, published by the Danish Energy Association and Energinet.dk,

202 Henrik Lawaetz, *The Green Certificate Market in Denmark. Status of implementation*, September 2001 (published on the website of the Danish Energy Agency in October 2001).

203 Cf. Articles 2 of the Act No. 944 of 27 December 1991 on Subsidies for Electricity Production.

204 The approval was received on 3 October 2000.

205 Niels I. Meyer, *Learning from Wind Energy Policy in the EU: Lessons from Denmark, Sweden and Spain*, European Environment, Vol. 17, 2007, p. 353; and the Union of the Electricity Industry (eurelectric), “Market Mechanisms for Supporting Renewable Energies: Tradable RES Certificates”, June 2001.

206 Citation from *Liberalization of the energy market – The Government’s Growth Strategy*, p. 9.

207 Niels I. Meyer, *Learning from Wind Energy Policy in the EU: Lessons from Denmark, Sweden and Spain*, p. 353.

208 Decided as part of the reform follow-up agreement of 22 March 2000 between the Government (The Social Democratic Party and the Danish Social-Liberal Party).

209 The obligation was laid down in Article 9f. in 1996 by Act No. 486 of 12 June 1996.

210 Act No. 1091 of 17 December 2002 amending the Electricity Supply Act as well as the Act on Subsidies to Electricity Production.

concluded that a smart grid – compared with traditional expansion – is the most efficient method of addressing future challenges from a socio-economic perspective. A new report, “Smart Grid in Denmark 2.0”, points to the removal of two key barriers. The first barrier is constituted by the fact that the existing regulation does not support grid companies using smart grid technology in the electricity grid. The second barrier is that, at present, grid companies do not have a real option of using price signals as a means of activating consumers’ flexibility. As mentioned *supra* in part 5.3., the Government launched a “Smart Grid Strategy” in April 2013 that combines the ambitions on electricity meters, read on an hourly basis, with variable tariffs and a data hub.

5.6 District Heating Services

Historically, Danish heating services started early in the twentieth century, when waste heat from power stations was supplied to buildings in the immediate neighbourhood. The first version of the Heating Supply Act, and the two acts on spatial planning (the State and Regional Planning Act and the Municipal Planning Act), were all passed in the period 1974-1976 with a focus on decentralisation of political power and a strong co-ordination with local elected regional councils and municipalities. The most important measures in respect to heating were binding spatial planning and binding district heating planning.

5.6.1 Promoting the Use of Waste as Renewable Energy

The Heat Supply Act²¹¹ was the first Act with a clear focus on renewable sources, when the Parliament passed the amendment to the Act (1990) for the purpose of implementing parts of the “Energy 2000” policy plan and a political agreement on promoting the development of decentralised CHP was reached. The aims of the Act were explicitly to promote the most socio-economic and environmentally friendly use of energy for heating buildings and supplying hot water, and to reduce the dependency on oil. The Act gave the Minister of Energy wide power to control the choice of fuel in block heating units, district heating plants and decentralised CHP plants. The minister used the power to send out “Letters of Specific and General Preconditions” to the municipalities and owners of heating plants, describing the prospect of voluntarily converting from coal and oil to more environmentally desirable energy sources.

5.6.2 Heating Supply Systems in Municipal Spatial Planning

There is no direct competition in the heating sector, as the connection of households and industries to the publicly owned system is mandatory. As part

211 Act No. 382 of 13 June 1990.

of the municipal building procedure, construction according to the Building Construction Act²¹² ensures that other legislation is complied with. The municipality must, therefore, assess whether the building should be connected to the district heating system. Both the Planning Act²¹³ and the Heat Supply Act²¹⁴ in force provide a legal basis for putting obligations on the owners of buildings located in areas with collective heating systems. The Planning Act contains a rule making it possible for the municipalities to publish local plans ordering the owners of new buildings in the relevant areas to be connected to the district heating supply system. The municipalities also have a competence based on the Heat Supply Act to order the owners of buildings to join the common district heating system. After receiving such an order, the owners have a duty to continue as users of the system.

5.6.3 Heating Supply Utilities are Restricted on Sources

The overall regional and municipal spatial planning established the legal framework for district heating planning. Municipalities must include heating planning in their mandatory review of their municipal plans every four-year. Every new heat supply project has to be in harmony with the spatial planning. The owners of heat-producing plants cannot replace conventional energy sources with more environmentally friendly sources (for example solar panels) without a permit from the municipality.²¹⁵

The possibility of having cheaper and more environmentally friendly production of heat through the use of heat from energy-smart water utilities is not, in itself, a goal based on the Act. This was the clear interpretation of the rules made by the Energy Appeal Board in October 2009.²¹⁶ The Board ruled that the municipalities could *only* approve use of CO₂-free fuel in district heating plants *if* the capacity of the plant were increased *and if* the new CO₂-free fuel were only to be used for the applied-for increase in heat production. The description of the aims of the Act was amended in June 2010 – making it clear that the Appeal Board made the right decision.²¹⁷ The Act now states explicitly that the most socio-economic use of energy sources has the highest

212 The Consolidated Act No. 452 of 24 June 1998, as amended by Act no. 404 of 27 December 2008.

213 The Consolidated Act No. 937 of 24 September 2009 with later amendments.

214 The Consolidated Act No. 347 of 17 May 2005 with later amendments.

215 The municipalities shall approve projects for establishing new collective heat supply plants and major alterations of existing plants, *cf.* Article 4, Paragraph 1 of the Heat Supply Act. The conditions for the assessment of applications are laid down in the Statutory Order No 1295 of 13 December 2005 on Approving Projects for Collective Heating Installations.

216 The Energy Complaints Board's decision of 12 October 2009 on a municipality's refusal to approve a project for the development of a biomass-fired boiler.

217 Act No. 622 of 11 June 2010.

priority. The goal of reducing energy supply dependence on fossil fuels is only a subsidiary priority.

5.6.4 Consumer Prices Based on the Full-cost Recovery Principle

The district heating supply system is not based on normal market principles. It is based on the principle of ‘full-cost recovery’ controlled by the Danish Energy Regulatory Authority. The price for receiving services has to be equivalent to the long-term marginal costs of producing the heat – *cf.* ‘the avoided cost principle’.²¹⁸ Based on Chapter 4 of the Heat Supply Act, the price for receiving services has to be equivalent to the long-term marginal costs of producing the heat. This principle means that income and expenditure must balance over a sequence of years. The price-calculation principle ensures that the charge each individual consumer has to pay is a genuine reflection of the long-term marginal costs of producing heat.

The Act was amended in 2000²¹⁹ as a consequence of the “Electricity Reform Agreement” from 1999 to ensure that the prices in the district-heating network were not affected by the liberalisation of the electricity market. The liberalisation and the CHP made it necessary to change the rules on the pricing of the heating service. At the same time, the amendment ensured special support for renewables with a new article establishing a clear (and narrow) exemption from the principle of full-cost recovery. It allowed heating and CHP plants based only on renewable sources to receive some production subsidies.

5.6.5 Taxes on Utilisation of Waste as Energy Sources

Taxes on CH₄ relevant for sludge from the water utilities were introduced in 2008 and the tax rate for CO₂ taxes was increased from DKK 3 to DKK 90 per tonnes. The rate for CO₂ taxes was decided on the basis of an expected CO₂ allowance price, which for 2008-2012 was estimated at DKK 150 per tonnes, effective from 2008.²²⁰ Biofuels are exempt from the CO₂ taxes. A new NO_x tax was introduced as part of the “Energy Agreement 2008”. The tax rate is DKK 5 per kg NO_x, effective from 1 January 2010. As a result of the Financial Act 2012, the tax will increase to DKK 25. The Act on Taxes on Wastewater²²¹ subjects the treatment of wastewater to a NO_x tax, a phosphor tax and a discharge of wastewater organic material tax, calculated as biological oxygen demand after 5 days.

218 The principle is described in Chapter 4 of the Heat Supply Act.

219 Act No. 436 of 10 June 2000.

220 Danish Economic Councils, *Economy and Environment 2009. English summary*, p. 7.

221 Act No. 938 of 27 June 2013.

5.7 *Danish Water Resources, Water Utilities and Legislation*

Compared to other countries, Denmark has a unique groundwater resource of very high quality and of large quantities. Indeed the groundwater is so clean that it provides the direct source of drinking water. Denmark's available groundwater resources – about 1 billion m³/year – are generally sufficient to meet national water supply requirements (between 600 and 700 million m³/year in recent years).²²² Thus, groundwater accounts for 98-99 % of the consumption of water. Often the treatment of the groundwater is limited to the removal of iron and manganese by oxidation and filtration, with this being enough to meet the EU quality standards established by the Drinking Water Directive.

Some 94 % of sewage discharges are subject to secondary treatment and 67 % to tertiary treatment in order to meet the quality standards of the Urban Wastewater Directive. Wastewaters are treated in several different stages: mechanical, biological and chemical purification, and finishing treatment. Biological purification converts organically bound nitrogen into nitrate by mixing air with activated sludge and wastewater in tanks. This sludge can be used by energy-smart water utilities to produce renewable energy. Discharge of wastewater from the sewers is regulated both by a sewage plan²²³ and by mandatory pre-permissions.²²⁴

There are 10 different Danish acts regulating water. Several of the acts are very old and not well coordinated. The law is, therefore, not based on the holistic approach. There are statutory rules on protection of the groundwater resources in the Water Supply Act,²²⁵ the Nature Protection Act²²⁶ and the Environmental Protection Act.²²⁷ The Environmental Objectives Act is one of the youngest acts – it incorporated the provisions of the Water Framework Directive into Danish law in 2003. The Act stipulates the distribution of competences between the Ministry of the Environment (the Danish Nature Agency)²²⁸ and the 98 municipalities regarding the management of water sources. Most of the municipalities own and operate their own sewage treatment plants and water supply plants.

Denmark has a water supply sector with many small, consumer-owned water utilities.²²⁹ 99 % of the sewage utilities are municipally owned. The

222 OECD op. cit., p. 77.

223 Section 32 of the Act Environmental Protection Act makes it mandatory to draw up a plan for sewage treatment.

224 Sections 27-28 and 34 of the Environmental Protection Act.

225 Promulgation Order No. 635 of 7 July 2010.

226 Promulgation Order No. 933 of 24 September 2009.

227 Promulgation Order No. 879 of 26 June 2010.

228 The Agency has the overall responsibility for ensuring the correct implementation of the WDF and all the daughter directives as well as the Natura 2000 obligations.

229 In 2005, 158 publicly owned and 2,464 privately owned water supplies were registered in Denmark.

organization of the publicly owned water utilities that take care of water supply and wastewater treatment was changed by the Water Sector Act,²³⁰ which came into force on 1 January 2010.

5.7.1 The Water Sector Act – Focusing on Economic Efficiency

The Water Sector Act regulates the organization of the large publicly owned water utilities. These utilities must be organised as commercial companies on the basis of the rules for public limited companies (*Aktieselskaber* or A/S)²³¹ or as private limited companies (*Anpartsselskaber* or Aps). The organisation of A/S and Aps is based on the Act on Companies.²³² Both are limited liability companies.²³³ It is possible to appoint directors and board members with business experience.

5.7.2 Price Regulation, Benchmarking and Mandatory Full-cost Recovery

Chapter 3 of the Water Sector Act includes rules on incentive-based centralized price regulation as an important mechanism for improved economic efficiency. As mentioned *supra* in part 5.1., it is the Ministry for Business and Growth that has the power to calculate the individual prizes for the water utilities. The statutory rules in the Water Supply Act and the Sewage Works Payment Obligation Act regarding the charges to be paid for water supply activities and wastewater treatment respectively are supplemented by statutory orders as well as local regulations laid down by the municipal councils. Users of drinking water have to pay charges, which also cover compensation for the economic loss inflicted on farmers resulting from conversion of land use from normal agricultural production to more extensive methods to ensure protection of areas of special interest in the drinking water supply. This is specified in Sections 52a–52c of the Water Supply Act. The Sewage Works Payment Obligation Act²³⁴ sets the legal framework for the calculation of the wastewater payments. The Statutory Order on the maximum prices is framing a very complicated system for the price calculation.²³⁵ The councils are bound by the price levels

230 Act No. 469 of 12 June 2009 on the Organization of and the Economic Conditions for the Water Sector.

231 A public limited company must have a board of directors, consisting of at least three members.

232 Promulgation Order No. 322 of 11 April 2011.

233 This is a situation in which none of the members are liable personally for the debts of the company but only to the extent of the capital contributed by the shareholders (the share capital) and the rest of the company's assets. The municipalities are the owners of the share capital.

234 Promulgation Order No. 663 of 7 June 2010.

235 Statutory Order No. 122 of 8 February 2013.

calculated – partly on a benchmarking basis – by the Danish Competition and Consumer Authority. It is a condition of operating costs that environmental targets are recognized in the water company's price cap, with either the state or the local council deciding the goal.

Chapter 2 of the Water Sector Act makes benchmarking mandatory. The Danish Competition and Consumer Authority is responsible for the use of performance benchmarking to identify industrial efficiency potential in the water utilities. The details of this performance benchmarking, which have to be goal oriented and used on an individual basis in the calculation of each water utility's price level, are not actually laid down in statutory rules. Resource efficiency is not part of the benchmarking and price-setting process. Water utilities are also obligated to complete benchmarking themselves. The Danish Water Utility Association (DANVA) has taken a target approach to the annual benchmarking of water utilities, based on an alternative model.

The consumer charges from water and sewage activities are at the same time based on the 'full-cost recovery principle', and the accounting for these two services has to be unbundled. Therefore, the utilities have to use the revenue from user charges as the basis for covering the costs associated with infrastructure facilities and services etc. The full-cost recovery principle is a traditional principle for all municipality activities. It means that income and expenditure must balance over a sequence of years. Municipal councils may not subsidize a limited number of citizens, nor use supply activities to increase their revenue. Cross subsidising between water utilities in the water supply and wastewater treatment is also prohibited.

On the basis on this regulatory system, the utilities are not able to use the surplus for facilities needed for the promotion of renewable energy production – or to invest in other non-traditional technologies. The system is consequently not promoting energy-smart water utilities.

The exact charges and the use of revenue vary depending on local conditions. Wastewater accounts for 48 %, with fixed contributions making up 6 % and variable contributions 42 % of the consumer prices. The final 30 % consists of state taxes and value added tax. The wastewater share of the total water price continues to rise. From 2008 to 2009, it increased from 46.9 % to 47.5 %.²³⁶

5.7.3 Unbundling and Other Restrictions on Energy-smart Water Utilities

Only a few of the water utilities are currently multi-utility companies covering water supplies, wastewater treatment, and heating supply based on renewable energy production. Danish water utilities are only allowed to take part in activities other than the traditional activities described *supra* in part 2 if such activities are closely related to water supply and wastewater treatment activities. They are only allowed to collect, transport and clean wastewater and

236 DANVA, *Water in figures. DANVA's Benchmarking and Water Statistics 2010*, p. 5.

safeguard water supply services, see *supra* part 2.1. It is only possible to act as an energy-smart water utility as one company if the produced energy is used by the utility, or if the distribution and trading of energy services is under a cap between 2,5- 10 billion DKK yearly, depending on the utilities yearling sales.²³⁷ If water utilities want to sale more renewable energy, they have to set up a separate company unbundled from the water utility, and the energy trading has to be commercially subject to capital market competition. Such activities are therefore unbundled from traditional water services in water utilities by means of the organizational set-up and trading system. The Electricity Act also has an impact on the conditions for energy-smart water utilities.²³⁸ It states that municipalities may only participate in other activities associated with the activities covered by this Act²³⁹ if an independent, ‘limited liability company’ carries out such activities on commercial terms. Traditional water services cannot, therefore, be integrated with renewable energy production in the same company – as an integrated smart-energy water utility’s activities – but water utilities can be the owner or co-owner of such an energy-producing facility.

Participation in electricity production requires that utilities invest in financially attractive on-site energy generation, such as utilization of biogas from anaerobic sludge digesters, with the utility restricted by the rules on loans for projects. The municipality, as the owner, is obligated to deposit funds equal to the full project investment costs upfront under a statutory order on loans.²⁴⁰

5.8 *Danish Conditions for Public-Private Partnerships (PPP)*

Denmark has taken a reluctant stance towards public-private partnerships (PPP). The Ministry of Finance introduced the PPP concept in 1999. In 2004, the Government launched a “PPP Action Plan” with 10 initiatives to support a widespread use of the instrument but without success. The PPP Competence Unit established under the Ministry of Economic and Business was only responsible for the facilitation of construction-type PPP projects (for example schools, sports arena etc.). The Danish Competition and Consumer Authority has launched a standard model for PPP for the purpose of making it more attractive. It is available in two variations: a model for new construction and a model for renovation. Neither of them relates to water utilities. Unlike many other countries, Denmark has not established a central PPP department under the Ministry of Finance, but under the Ministry of Business and Growth, and PPP departments have neither been established in the Ministry for the Environment, nor in the Ministry for Climate, Energy and Building. The

237 This is a consequence of both Section 18 of the Water Sector Act and the Statutory Order no. 1195 of 14 October 2010, as amended by Statutory Order No. 1386 of 13 December 2010.

238 Sections 2(1) and 4(2)-(4) of the Electricity Act.

239 Section 4(2) of the Electricity Act.

240 Statutory Order No. 68 of 1 January 2013.

restrictions on municipalities in respect to access to private lending and leasing have also made it less attractive than traditional procurement models.²⁴¹

The PPP legislation has been somewhat incoherent, and the interest in such projects has therefore been limited. PPP projects at local level are subject to a comprehensive set of legal acts. The legal rules require the full project value to be reserved upfront when commencing a PPP project, and the municipal reserves would have to include value added tax (VAT), which is 25 %.²⁴² Another important barrier to PPP is that there is no general set of rules for the tax treatment of PPP projects, which creates insecurity in the PPP market for projects with certain characteristics.²⁴³ In respect to water services, it is the municipally owned utility companies that will be the primary public actor in PPP on energy-smart water utilities. Only the biggest water companies have the relevant financial, technical, legal and organizational competences available to use PPP as a means to establish new facilities through private funding etc.

5.9 *Summing up on the Barriers in Danish Legislation*

Specialization in the Danish legislation and administration makes it difficult to ensure solutions that effectively handle the many interrelated challenges caused by climate change, resource security, urbanization etc. Functionally defined normative systems – with their respective specialized authorities – make it necessary to develop integrative arrangements, which do not currently form part of the administration of the legislation that of relevance for the water utilities. The consequence of this specialization is actually that there is a regulatory area covering energy issues that is clearly separated from the normative system that regulates water, and most problematically, the Water Sector Act and the Competition and Consumer Authority do not accept the relevance of environmental and energy resource efficiency. The complex and uncoordinated rules – lacking in flexibility – may be the cause of a major bottleneck for the future of energy-smart water utilities.

There has been a tradition of ensuring municipalities have the competence to take care of water services, waste services and energy services. There is no direct competition in the water sector, as the connection of households and industries to the publicly owned water networks and services is, typically, mandatory. There are several publicly owned stock companies, for example in the electricity, heating, waste and water treatment sectors. The Water Sector Act is the most important act that determines the conditions facing the public owned water utilities. It promotes the liberalisation of the water supply and sewerage supply sectors, but does not permit water utilities to produce

241 Anders Eldrup and Peter Schütze, op. cit., p. 63.

242 Ole Helby Petersen, *Regulation of public-private partnerships: the Danish Case*, in *Journal Public Money and Management*, May 2010, p. 175-178. DOI: 10.1080/09540961003794345.

243 Anders Eldrup and Peter Schütze, op. cit., p. 63.

renewable energy as part of their main activities. Price regulation based on economic efficiency benchmarking is a strong example of the competition approach and is supplemented by the public service approach in the Act that do not accept traditional commercial innovative activities. The public owned water utilities are also regulated by the traditional rules facing municipalities, which do not permit municipalities to take part in business activities. The municipalities, as well as the municipally owned utilities, have to use the revenue from user charges as the only accepted basis to cover the costs associated with the infrastructure facilities and services etc. The Danish Competition and Consumer Authority – which is independent of both the Ministry for the Environment and the Ministry for Climate, Energy and Buildings legislative approaches – is responsible for ensuring that water services respect the “full-cost recovery principle”, centralized pricing levels, and the state-driven performance benchmarking that solely focuses on economic efficiency. Driving environmental and energy resource efficiency is not part of the Authority’s state-authorized remit.

6 Concluding Remarks

The appeal in the Treaty of Lisbon to the principle of conferral, the internal market, sustainable development, external integration of environmental policy into all policies, social and economic inclusion, and other guiding principles make it possible to reach agreement between the 28 member states²⁴⁴ on delicate and controversial political questions by politically deferring the practical effects to a legal solution to be derived from the universally agreed principles – with the integration and balanced consideration of social, economic and environmental goals.²⁴⁵ The ambition behind the concept of sustainability in the Treaty of Lisbon is to achieve greater coherence of policy and actions and to avoid contradictory policies at different levels. As described *supra* in parts III and IV, the promotion of renewable energy in the EU is now based on a holistic approach as part of the obligation to ensure sustainable development. The concept of sustainability – with energy and environmental policies inextricably linked to each other, particularly when it comes to climate mitigation²⁴⁶ – impacts on the co-ordination of the law, but there are still legal obstacles for European energy-smart water utilities.

The EU rules require that member states meet targets on renewable energy, energy efficiency and reduction of GHG emissions, sustainability criteria and environmental performance standards. The legislation includes a range of

244 On 1 July 2013 Croatia officially became the EU’s 28th member state.

245 Tine Sommer, *op. cit.*, p. 66; and Advocate General of the Court of Justice of the European Union Miguel Poiares Maduro, *Interpreting European Law: Judicial Adjudication in a Context of Constitutional Pluralism*, Working Paper IE Law School, AJ8-149-I, 05-02-2008, p. 11.

246 See also German Advisory Council on the Environment, *Pathways towards a 100 % renewable electricity system. Special report*, October 2011, p. 175.

remedies that member states may adopt in applying the conditions and targets, including market-based instruments, fiscal instruments, and command-and-control mechanisms, as well as mechanisms restructuring traditional command-and-control mechanism rules. Market integration and equal market entry opportunities for demand-side resources (supply and consumer loads), alongside generation of energy, should be pursued to ensure continued deployment of smart grids and the involvement of energy-smart water utilities as “prosumers”.

Decisions on the concrete design of national renewable energy policy are based on the member states’ own political priorities and traditions. National policy and law are expected to be a combination of national traditions, political and economic priorities and implementation of EU obligations. However, national political priorities have, as illustrated *supra* in part V, been the most important forces in the design of Danish law. National law is primarily based on national traditions of specialization, on special municipality legal principles included in the relevant acts and the public law principles and on political agreement focusing on the promotion of special renewable energy technologies, especially wind technology. This situation raises a number of issues concerning horizontal competency overlaps and gaps in the promotion of new renewable energy technologies. One of the central features is to avoid the barriers created by uncoordinated and counterproductive principles on municipality activities, involving the full-cost recovery principle, restrictions on public-private partnerships and restrictions on combining water and energy services in one water utility. Danish policy and law on electricity is characterised by a focus on cost-effectiveness through the use of market-based instruments more than it is focused on giving a high priority to renewables. The top-down regulations actually result in a stronger position for the ordinary energy sources (natural gas and waste) in the heating supply law compared to new renewable energy technologies. The promotion of renewable energy sources is subsidiary to the economics of the common heating supply system. The Water Sector Act aims to improve economic efficiency through a performance benchmarking system focusing on quality, the environment, security of supply and efficiency, based on user demand, to introduce centralised incentive-based price regulation and to ensure a modernisation process in the water sector, increasing the economic efficiency of operations and transparency in water utilities. The Danish Competition and Consumer Authority is only responsible for the control of transparency and economic efficiency in the water sector, and it is not interested in resource efficiency. The design of Danish energy and water legislation does not make investment in energy-smart water utilities one of the emission reduction investments attractive to those who undertake and pay for them.

In respect to the promotion of energy-smart water utilities, it is therefore relevant to ask if there is a need for EU intervention or if member states and individuals are in a better situation to promote such resource-efficient actors. The answer to this question can be found *partly* in the description of the secondary EU legislation and Danish legislation in part IV and part V respectively, *partly* in the special energy-related Article 194(1) TFEU that grants the EU institutions competence as regards the following energy policy

goals: (a) the functioning of the energy market, (b) security of energy supply in the Union, (c) energy efficiency and energy saving and the development of new and renewable forms of energy, and (d) promotion of the interconnection of energy networks. It would not contravene Article 194 TFEU and Protocol No. 26 if the EU institution decided to promote energy-smart water utilities through more demanding legislation. The author's answer to the question is: "yes - maybe" as the EU legislative approach is more holistic, coordinated, innovative and flexible compared with the Danish legislative approach.

