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Kloosterhuis, Erik; Mulder, Machiel

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COMPETITION LAW AND ENVIRONMENTAL PROTECTION: THE DUTCH AGREEMENT ON COAL-FIRED POWER PLANTS

*Erik Kloosterhuis** & *Machiel Mulder†*

ABSTRACT

Agreements between firms to jointly reduce production capacity generally violate competition law, unless specific conditions are met. These conditions imply that the agreements need to realize benefits for consumers that could not otherwise be realised. Together, we call them “efficiency defence.” Initiated by a societal debate in the Netherlands, we analyze how environmental benefits can be included in this framework. We apply this analysis to a proposed agreement among electricity producers to jointly advance the closure of a number of coal-fired power plants. Using shadow prices as developed in environmental economics, we assess the environmental benefits of this proposed agreement. We conclude that the environmental benefits for the consumers involved are significantly smaller than the loss of consumer welfare resulting from the increase in the electricity price caused by the closure of power plants. Hence, such an agreement would infringe competition law. This case, however, shows that it is feasible to incorporate environmental effects into an efficiency defence of an anticompetitive agreement made for the purpose of sustainability.

JEL: D40; H40; K21; L44

I. INTRODUCTION

A. Dealing with Environmental Benefits in Competition Analysis

Although the primary goal of competition law is to protect competition, this is generally not considered to be a goal in itself. Competition is seen as a means to promote welfare.¹ Consequently, in recent years more attention is paid to

* Authority for Consumers & Markets, the Netherlands. Email: erik.kloosterhuis@acm.nl.

† Authority for Consumers & Markets, the Netherlands, and Faculty of Economics and Business, University of Groningen, the Netherlands. Email: machiel.mulder@rug.nl. The authors thank Michaela Drahos, Walter Ruijgrok, the participants of the 9th Annual Competition & Regulation Meeting of the Amsterdam Center of Law and Economics (ACLE) at the University of Amsterdam, an anonymous referee as well as several colleagues at the Authority for Consumers and Markets, for valuable comments. The authors are, however, fully responsible for any remaining shortcomings. This article does not constitute any obligation to the Authority for Consumers & Markets.

¹ Stephen Martin, *The Goals of Antitrust and Competition Policy* (Purdue U. Ciber Working Papers, Paper No. 48, 2007), <http://docs.lib.purdue.edu/ciberwp/48>; Ioannis Lianos, *Some*

the question how to take possible efficiencies into account in the assessment of competition-restrictive behavior.² At present, under European and Dutch competition law, efficiencies can be invoked as a defence if they compensate for the negative effects of competition restrictions caused by mergers, agreements, or unilateral behavior by dominant firms.³ Although the term “efficiency defence” is more commonly used in merger cases, under European and Dutch competition law the same principles apply in the three subdomains of competition law (anticompetitive agreements, mergers, and abuse of dominant position).

A greater emphasis on efficiencies, as can be observed in recent years, raises new questions concerning the limits of an efficiency defence. One question is where to draw the line between efficiencies and public interests that cannot be incorporated in an efficiency defence. This question is especially relevant with respect to agreements that embody Corporate Social Responsibility. It appears that competition law is perceived as a hindrance for the conclusion of such agreements.⁴ This tension exists more in general between self-regulatory initiatives and competition law.⁵ More specifically, also the relationship between competition law and agreements that aim to protect the environment has been discussed widely. It appears from this discussion and from decisions of the European Commission (the Commission) and national competition authorities that competition law gives a certain although limited scope to take environmental considerations into account.⁶

In the recent past, also the Netherlands showed a lively debate among politicians, stakeholders from industries, NGO’s, and scientists on the possibilities of firms to cooperate in the supply of more sustainable products under

Reflections on the Question of the Goals of EU Competition Law, in HANDBOOK ON EUROPEAN COMPETITION LAW, SUBSTANTIVE ASPECTS 1 (Ioannias Lianos & Damien Geradin eds., Edward Elgar Pub. 2013); MASSIMO MOTTA, COMPETITION POLICY, THEORY AND PRACTICE, 17–30 (Cambridge Univ. Press 2004).

² MARC IVALDI & ALEKSANDRA KHIMICH, TOWARDS GUIDELINES FOR EFFICIENCY ANALYSIS IN MERGERS AND ANTITRUST CASES (2014); Mitja Kocmut, *The Role of Efficiency Considerations Under EU Merger Control* (U. Oxford Ctr. Competition L. & Pol’y, Working Paper No. 05, 2009).

³ See Communication for the Commission—Guidelines on the Application of Article 101(3) of the Treaty, 2004 O.J. (C 101) ¶¶ 38–116 [hereinafter Commission Guidelines Article 101(3)]; Communication from the Commission—Guidance on the Commission’s Enforcement Priorities in Applying Article 82 EC Treaty to Abusive Exclusionary Conduct by Dominant Undertakings, 2009 O.J. (C 45) ¶¶ 28–31; Commission Notice on the Appraisal of Horizontal Mergers Under the Council Regulation on the Control of Concentrations Between Undertakings, 2004 O.J. (C 31) ¶¶ 76–88.

⁴ Wim Dubbink & Frans Paul van der Putten, *Is Competition Law an Impediment to CSR?*, 83 J. BUS. ETHICS 381, 386–87 (2008).

⁵ Michael Hutchings, *Too Difficult to Legislate: The Competition Law Implications of Private Sector Regulation Substituting for Government Action*, 33 EUR. COMPETITION L. REV. 222, 244 (2012).

⁶ See *infra* Part II.

competition law.⁷ In early 2013, the Dutch House of Representatives requested the Minister of Economic Affairs to instruct the Authority for Consumers & Markets (ACM), by means of a policy rule, on how to assess agreements regarding animal welfare and the environment in the agricultural and nutrition sector.⁸ According to section 5 of the Dutch Competition Act⁹ (hereafter referred to as Mw) the Minister of Economic Affairs (the Minister) can lay down policy rules *inter alia* to instruct the ACM on how to take into consideration other than economic interests in its assessment of competition-restrictive agreements. Following the request of the Parliament, the Minister published a policy rule on competition and sustainability (the Policy Rule) on May 8, 2014.¹⁰ The Policy Rule concerns the application of the Competition Act to anticompetitive arrangements made for the purpose of sustainability. Section 3 of the Policy Rule sets out how aspects that are specific to sustainability must be taken into account in the application of section 6(3) of the Mw, the Dutch equivalent of article 101(3) of the Treaty on the Functioning of the European Union (TFEU).¹¹ A fundamental principle of the Mw is that it is not stricter or more lenient than the competition law of the European Union. This means, that the Policy Rule cannot lead ACM to deviate from the European competition law in any case.¹² The ACM published a Vision Document Competition & Sustainability (Vision Document) on how to implement the Policy Rule.¹³

⁷ The papers presented at the University of Amsterdam at the ACLE conference about the Public Interest-Defense in Cartel Offenses in December 2013 constitute a valid example. For more information about the conference and the papers presented therein, see *December 12th 2013: The Public Interest-Defense in Cartel Offenses*, UNIVERSITEIT VAN AMSTERDAM (Jan. 2, 2014), <http://acle.uva.nl/events/competition--regulation-meetings/2013/december-12th-2013-the-public-interest-defense-in-cartel-offenses.html>.

⁸ Dijkgraaf/Geurts motion of 24 January 2013, Parliamentary Documents II, 2012/2013, 33 400 XIII, nr. 99.

⁹ Dutch Competition Act, (Mededingingswet), Dutch Government Gazette (June 24, 1997).

¹⁰ Dutch Government Gazette, Decision of the Minister of Economic Affairs of May 6, 2014, No. WJZ/14052830, Containing the Policy Rule Regarding the Application by the Netherlands Authority for Consumers and Markets of Section 6, Paragraph 3 of the Dutch Competition Act in Anticompetitive Arrangements that have been made for the Purpose of Sustainability (May 8, 2014), <https://www.acm.nl/en/download/attachment?id=11880> [hereinafter Policy Rule].

¹¹ Consolidated Version of the Treaty on the Functioning of the European Union, May 9, 2008, 2008 O.J. (C 115) 47 [hereinafter TFEU].

¹² This is also stressed in the explanatory notes to the Policy Rule itself ("As a result, a general framework that is specific to sustainability is created within which ACM can make its concrete, individual assessment in order to carry out its tasks, while retaining its freedom of judgment, and which is in accordance with the national and European antitrust frameworks"). See Explanatory Notes to the Policy Rule, *supra* note 10, at 3.

¹³ THE NETHERLANDS AUTHORITY FOR CONSUMERS & MARKETS, VISION DOCUMENT: COMPETITION & SUSTAINABILITY (May 2014), <https://www.acm.nl/en/publications/publication/13077/Vision-document-on-Competition-and-Sustainability/> [hereinafter Vision Document]. Both the Policy Rule and the Vision Document were in discussed with interested parties in draft form.

B. Case: The Dutch Energy Deal

The first test case for the Policy Rule and the Vision Document was the call to include environmental considerations in the competition analysis of the so-called Energy Deal. In order to foster the transition towards a more sustainable energy industry in the Netherlands, a large group of over 40 stakeholders entered into an agreement to implement a number of measures.¹⁴ The group of stakeholders includes employer organisations, labour unions, environmental NGOs, consumer organisations, central, regional and local governments, and representative organisations of energy firms. The Energy Deal aims to improve the efficiency of energy use, to foster the development of renewable-energy capacity and to reduce the dependence on fossil fuels.¹⁵ The Energy Deal includes a package of policy measures to give incentives to energy users, such as an increase in the energy tax on residential energy use, to give incentives to energy producers, such as subsidies for offshore wind parks, and to reduce the costs for energy producers, such as the abolishment of the tax on the use of coal by electricity firms.

From a competition policy perspective, one specific measure was particularly relevant: the proposed agreement to advance the closure of 5 relatively old coal-fired power plants by a few years (the Agreement).¹⁶ These plants, which were built in the 1980s, have a higher rate of environmental pollution (particularly CO₂, SO₂, NO_x, and small particulate matter) than more recently built coal-fired power plants, gas-fired plants and, of course, renewable generation techniques like wind-power plants and solar cells. Over the past decades, however, the degree of pollution by the old coal-fired plants has already

¹⁴ SOCIAL ECONOMIC COUNCIL, ENERGY AGREEMENT FOR SUSTAINABLE GROWTH (Sept. 6, 2013), <http://www.ser.nl/~media/files/internet/talen/engels/2013/energy-agreement-sustainable-growth-summary.ashx>. SER is a tripartite body representing industry, trade unions and independent experts appointed by the government. It has traditionally played an important role in the governance of the Dutch economy. This can be seen as an expression of what in Dutch is called the “polder” or “overleg-economie,” a governance system in which mutual consultations leading to consensus are the preferred method of steering the national economy. This model is challenged from time to time, but “sooner or later the Dutch will return to negotiating with each other again.” See *Reform in the Netherlands: Going Dutch*, ECONOMIST (Oct. 7, 2014), <http://www.economist.com/node/3270777>.

¹⁵ Policy Rule, *supra* note 10, at 29–34.

¹⁶ The five plants to be closed earlier are: (1) Amer 8 owned by RWE (645 MW) to be closed in 2016 instead of 2017; (2) Borssele, owned by Delta (406 MW), to be closed in 2016 instead of 2021; (3) Maasvlakte I and (4) Maasvlakte II, owned by E.ON (520 MW each), to be closed in 2017 instead of 2021, and (5) Gelderland 13 owned by GdF (602) to be closed in 2016 instead of 2017. See ENERGY RESEARCH CENTRE OF THE NETHERLANDS, EFFECTEN VAN VERSNELD SLUITEN VAN DE VIJF OUDSTE KOLENCENTRALES (2013) (noting the effects of accelerated closure of the five oldest coal-based power plants). Note that a number of new coal-fired plants of in total 3,400 MW are becoming operational in the Dutch market. In addition, the capacity of wind and solar power plants is increasing. Because of these investments, as well as the reduction in demand caused by the economic crisis, the level of total installed capacity is significantly above peak demand, depressing electricity prices.

declined because of a number of retrofit investments, such as in installations to desulphurize emissions. Closing these plants may nevertheless result in less environmental damage.¹⁷ This reduction in environmental damage can be seen as a public interest, since that damage is an externality which is not taken into account by the producers. Besides the benefit following from the environmental effect, the closure of the coal-fired power plants may create costs as well. The aggregated generation capacity of these plants is about 2500 MW, which is about 10 percent of the total generation capacity in the Netherlands. As this is a significant share, one could expect that the agreement to remove the capacity from the market has an impact on competition and therefore on the electricity price. Because of this, the parties asked the ACM to give its view on the Agreement. This article reflects the analysis which was published by the ACM.¹⁸

C. Article Outline

In part II, we describe the legal framework with references to the Policy Rule and the Vision Document. Then, in parts III through V, we describe how the ACM analyzed the impact of the Agreement on competition and the electricity price (that is, the costs), and on the environment (that is, the benefits). We show how ACM estimated the costs and benefits in terms of consumer surplus, which, technically speaking, is equal to the aggregated area below the demand curve, less the actual financial expenditure on the good. This definition makes immediately clear that an increase of the price of a good reduces consumer welfare. More implicitly, this definition also clarifies that a good does not need to have a market price before entering the welfare function of consumers. Consumers may have a willingness to pay for goods which are not traded on markets, such as the quality of air or water. A reduction in this quality may, therefore, have a negative effect on consumer welfare. This implies that the economic analysis of costs and benefits is not fundamentally affected by the existence or absence of market prices. Of course, relatively more effort has to be made to include non-priced effects in the economic analysis. We will discuss and apply several techniques to deal with this issue.¹⁹

¹⁷ The damage caused by CO₂ consists of its contribution to climate change. SO₂, NO_x and small particulate matter have an effect on acid rain, which damages many parts of the environment, such as forests and buildings. They may also cause lung damage and other illnesses. In addition, coal-fired power generation may contribute to the formation of smog.

¹⁸ On September 26, 2013, ACM published an opinion comprising an informal assessment of the agreement from a competition law perspective. ACM, ANALYSIS BY THE ACM OF THE PLANNED AGREEMENT ON CLOSING DOWN COAL POWER PLANTS FROM THE 1980S AS PART OF THE SOCIAL AND ECONOMIC COUNCIL OF THE NETHERLANDS' SER ENERGIEAKKOORD (Sept. 26, 2013), <https://www.acm.nl/nl/publicaties/publicatie/12033/Notitie-ACM-over-sluiting-5-kolencentrales-in-SER-Energieakkoord/> [hereinafter ANALYSIS].

¹⁹ See, e.g., ROGER PERMAN, YUE MA, JAMES MCGILVRAY & MICHAEL COMMON, *NATURAL RESOURCES & ENVIRONMENTAL ECONOMICS* (2d ed. Prentice Hall 1999); Per-Olov Johansson,

In part VI, we conclude the quantitative part of the article by presenting the net effects on consumer surplus. We do this for a number of scenarios regarding external circumstances, while we include also a sensitivity analysis on the assumptions. Finally, in part VII, we present our conclusions as well as some reflections on the general applicability of our framework in environmental cases.

II. THE LEGAL FRAMEWORK AND ITS APPLICATION ON SUSTAINABILITY INITIATIVES

Section 6 Mw and article 101 TFEU give the fundamental components of the legal framework for assessing the agreement. These provisions imply that agreements between competitors to reduce production capacity are in principle a violation of competition law, unless they meet four cumulative conditions for exception.²⁰ Together we call these conditions the “efficiency defence.” These conditions are: 1) the agreement must contribute to improving production, distribution or technical or economic progress, 2) consumers must receive a fair share of the resulting benefits, 3) the restrictions must be indispensable to the attainment of these objectives, and 4) the agreement must not eliminate competition of a substantial part of the product in question.²¹

Important categories of cooperation agreements that may meet these four conditions are R&D agreements, specialization agreements and a variety of distribution agreements.²² “Naked” cartels that only aim to raise prices, restrict output or divide markets will usually not qualify for an exception because they do not meet the requirements of these conditions. We note that, for a long time, the last two of these four conditions seem to have been the core of the test.²³ As long as an agreement was not more restrictive than necessary and a sufficient degree of remaining competition in the market was assured, the presence of efficiencies and the pass on of a fair share thereof to the consumers were relatively easily accepted. Under influence of the more economic

Theory of Economic Valuation of Environmental Goods and Services, in HANDBOOK OF ENVIRONMENTAL AND RESOURCE ECONOMICS 747–754 (Jeroen C.J.M. van den Bergh ed., 1999).

²⁰ TFEU, *supra* note 11; Dutch Competition Act, *supra* note 9, § 6(3).

²¹ The responsibility to prove that an agreement that restricts competition is in conformity with these four conditions rests on the undertakings concerned. Because of the public importance of the agreement and, more generally speaking, of the SER Energy Deal, ACM carried out its own assessment of the anticipated effects of the Agreement.

²² See, e.g., Communication from the Commission—Guidelines on the Applicability of Article 101 (3) of the Treaty to Horizontal Cooperation Agreements, 2011 O.J. (C 11) [hereafter Commission Guidelines Article 101(3) on Horizontal Cooperation Agreements].

²³ Kati J. Cseres, *The Controversies of the Consumer Welfare Standard*, 3 COMPETITION L. REV. 121, 161 (2007).

approach from 2004 onwards, more attention is given to the assessment of possible efficiencies and to the pass on to consumers.²⁴

It is not self-evident, however, that sustainability agreements that restrain competition must be assessed on the basis of the efficiency defence. It is argued that, following the case-law on “inherent restrictions”²⁵ they may fall outside the scope of article 101 altogether.²⁶ In this view, weight is given to the fact the TFUE specifically mentions certain public interests, such as environmental benefits, in the so-called “integrating provisions.” Article 11 TFEU requires, for instance, that “(e)nvironmental protection requirements must be integrated into the definition and implementation of the Union’s policies and activities, in particular with a view to promoting sustainable development.”²⁷ Although ACM has considered that it cannot be ruled out that this principle may be applicable to sustainability initiatives, it views the existing jurisprudence as not sufficiently clear on this issue.²⁸ Consequently, ACM followed a more narrow approach that assessed the benefits of the Agreement within the efficiency defence framework.

A. First Condition: The Agreement Gives Rise to Efficiency Gains

The first step is to determine the benefits in terms of production, distribution, and technical or economic progress. As a short hand definition of these benefits we use the term efficiencies,²⁹ which can be divided into cost efficiencies and qualitative efficiencies. Qualitative efficiencies can materialize in better products, a better distribution of products or a greater variety of products.³⁰ Efficiencies may materialise with a certain time lag.³¹

The key question now is whether environmental benefits can be taken into account in an article 101(3) TFEU assessment and if so, to what extent. Individuals may attach value to the fact that goods are produced with an eye to sustainability and, therewith, to a more efficient use of scarce resources. Market prices often do not express this value, making it a negative externality in economic terms. In ACM’s view, reducing such externalities enhances the

²⁴ SUZANNE KINGSTON, *GREENING EU COMPETITION LAW AND POLICY* 265 (Cambridge Univ. Press 2012).

²⁵ Case C-309/99 J.C.J. Wouters v. Algemene Raad van de Nederlandse Orde van Advocaten (2002) E.C.R. I-1577.

²⁶ See, e.g., CHRISTOPHER TOWNLEY, *ARTICLE 81 EC AND PUBLIC POLICY* (Hart Publishing 2009); BEN VAN ROMPUY, *ECONOMIC EFFICIENCY: THE SOLE CONCERN OF MODERN ANTITRUST POLICY? NON-EFFICIENCY CONSIDERATIONS UNDER ARTICLE 101 TFEU* (Wolters Kluwer 2012); Anne C. Witt, *Public Policy Goals Under EU Competition Law—Now Is the Time to Set the House in Order*, 8 EUR. COMPETITION J. 443 (2012).

²⁷ TFEU, *supra* note 11.

²⁸ Vision Document, *supra* note 13, ¶ 3.3.2.

²⁹ Case T-168/01, GlaxoSmithKline v. Comm’n, 2006 E.C.R. II-2969 (in which the General Court used the short-hand term “efficiency gains” for the same purpose).

³⁰ Commission Guidelines Article 101(3), *supra* note 3, ¶¶ 59–72.

³¹ *Id.* ¶ 87.

quality of the products involved.³² Hence, agreements that reduce negative (environmental) externalities may improve efficiency. We opine that ACM's approach is in conformity with the Commission's view that other goals, like those pursued by the TFEU other than the competition rules, can be taken into account to the extent that they can be subsumed under the four conditions of article 101(3) TFEU.³³

B. Second Condition: Consumers Must Receive a Fair Share

After having defined the scope of the efficiencies that can in principle be taken into account in assessing the agreement, we have to consider what is meant by *a fair share for consumers* in the second condition of article 101(3) TFEU. ACM follows the approach that it is necessary to *at least compensate* consumers concerned for the negative impact of a restrictive agreement.³⁴ This interpretation allows the net benefit for consumers directly harmed by the agreement (the consumers in the relevant market) to be zero, but no less than zero. Note that this part of the test takes into consideration only the costs and benefits of the agreement for the consumers directly related to the objectives of the agreement, which makes it clearly different from a social cost-benefit analysis, in which all societal costs and benefits are assessed.

The Policy Rule states that also in the application of this second condition, the long-term benefits for consumers are to be taken into account.³⁵ This is in conformity with the view of the Commission that efficiencies may materialize with a time lag.³⁶ ACM also has taken the position that benefits for future consumers can be considered part of the compensation for the harm that an agreement causes to the present consumers.³⁷ After all, sustainable development often involves interests over an extended period of time.

C. Third Condition: The Agreement Is Indispensable

The third condition requires that an agreement cannot impose restrictions on competition that are not necessary for the realization of the efficiency improvements.³⁸ The degree in which competition can lawfully be restricted depends on the type of efficiencies at stake. By collectively undertaken sustainability initiatives, undertakings can, for example, realize economies of scale. Such co-operation, however, often does not need to be market-wide. On the other

³² Vision Document, *supra* note 13, ¶ 3.4.2.

³³ Commission Guidelines Article 101(3), *supra* note 3, ¶ 42; see also JONATHAN FAULL & ALI NIKPAY, *THE EU LAW OF COMPETITION* 186 (Oxford Univ. Press 3d ed. 2014).

³⁴ Commission Guidelines Article 101(3), *supra* note 3, ¶ 85.

³⁵ Policy Rule, *supra* note 10, § 2b.

³⁶ Commission Guidelines Article 101(3), *supra* note 3, ¶ 87.

³⁷ Vision Document, *supra* note 13, ¶ 3.5.2.

³⁸ Policy Rule, *supra* note 10, § 2c.

hand, as the Policy Rule explains, under specific circumstances a prisoner's dilemma may exist that causes the market to generate insufficient incentives to implement a welfare-enhancing sustainability initiative. In this case, under strict conditions, a market-wide arrangement could be considered.

Thus, the third condition adds an important element to the applicable legal framework. As far as producers can supply environmental-friendly products under competitive conditions, there is no reason to include the benefits thereof in an efficiency defence. Only when the market fails in this respect and an agreement can resolve this failure, thus promoting welfare, these benefits can be taken into account in an efficiency defence assessment.

The above does not imply that there are no other or better means to solve a problem than competition-restricting agreements. Obviously, the most common way to address environmental problems is by public intervention (such as taxes, subsidies, or regulatory solutions). Competition law comes into play when companies (often stimulated by governments) propose self-regulatory solutions. The third condition raises the question whether less restrictive solutions within reach of the companies involved are available, but not whether more effective or efficient public measures are available to reach the same goal.

D. Fourth Condition: The Agreement Does Not Eliminate Competition

The fourth condition requires that the agreement does not eliminate competition in a substantial part of the market. This means that competitive forces in the relevant market must remain functioning to a sufficient degree. This element of the framework is especially relevant in the case of market-wide agreements. The Policy Rule states that ACM must take into account the possibilities of sufficient competition on other competition parameters than the sustainability element of the agreement.³⁹ The Vision Document acknowledges that the fourth condition can be met if competition is, in this sense, restricted for a single competition parameter, but remains unrestricted for all other parameters.⁴⁰

III. APPLICATION OF THE FRAMEWORK ON THE DUTCH ENERGY DEAL

ACM has taken the view that it is plausible that section 6 Mw and article 101 TFEU would apply on the Agreement. In general, agreements to reduce capacity belong to the most severe cartel agreements that fall within the realm of these provisions. An additional requirement for article 101 to apply is that the agreement affects trade between member states. For this reason it is relevant that the Dutch electricity market is strongly connected to neighbouring

³⁹ Policy Rule, *supra* note 10, § 2d

⁴⁰ Vision Document, *supra* note 13, ¶ 3.5.4.

markets. Hence, for the purpose of the present analysis, we assume that both section 6 Mw and article 101 TFEU apply to the Agreement, which means that it is likely to be at odds with competition law unless there are sufficient compensatory efficiencies.

One aspect of using the efficiency defence framework on environmental benefits is that the benefits will often occur outside the product market where the negative effects appear. Also, in the present case, the beneficial effects appear on markets other than the product market that is the object of the agreement. These markets are, however, closely related because the pollution caused by the production of electricity means that such production uses a scarce natural resource (that is, clean air) as an input. Furthermore, we can include the beneficial effects only as far as they affect by and large the same group of consumers as the one that bears the costs of the agreement.⁴¹ We include the environmental benefits in our analysis only as far as these conditions are fulfilled.

The term “consumers” refers not only to residential end-users, but also to firms which consume electricity.⁴² Note also that the consumers must be compensated as a group; it is not required that every individual consumer is sufficiently compensated.⁴³

Another important issue is to assess the relationship between the Agreement and the efficiencies: is the Agreement really necessary to obtain the efficiencies? As said, the Agreement forms part of the Energy Deal, which has a much wider scope than the closure of the coal-fired power plants. So, the query is which costs and benefits should be taken into account in the assessment of the Agreement. This question must be answered by checking the causality between the Agreement and the costs and benefits. On the basis of this criterion we take into account all costs and benefits that directly and causally follow from the Agreement. This implies that we exclude those costs and benefits of the Energy Deal that require an active involvement of other parties (for example, governmental subsidies) or that the parties subjectively linked to the Agreement, such as investments in wind-power plants. Within this definition of the framework, we are able to analyze the effects of the Agreement. In part IV we analyze the impact of the Agreement on competition and the electricity price, while in part V we focus on the economic assessment of the environmental effects. Part VI presents the resulting net effect on consumer surplus.

⁴¹ Commission Guidelines Article 101(3), *supra* note 3, ¶ 43; Commission Decision, Case No. COMP/AT 39595, *Continental/United/Lufthansa/Air Canada*, 2013 O.J. (C 2836) 20–21. The Commission carefully considered so-called out-of-market efficiencies and took them into account as far as they benefited the consumers that are harmed by the agreement. *See also* Alexander Italianer, *Competitor Agreements Under EU Competition Law*, Speech for the 40th Annual Conference on International Antitrust Law and Policy, Fordham Competition Law Institute in New York (Sept. 26, 2013).

⁴² Commission Guidelines Article 101(3), *supra* note 3, ¶ 84.

⁴³ *Id.* ¶ 87.

Figure 1. The merit-order effect
Source: Author's own drawings.

IV. IMPACT OF THE AGREEMENT ON COMPETITION AND PRICE

A. Method

The impact of a removal of production capacity from the market depends on the competitive position of that capacity—that is, its position within the merit order—as well as the level of total demand. A removal of production capacity means that a part of the supply curve shifts to the left. In electricity markets, this effect is called the merit-order effect. If the removed capacity has relatively low marginal production costs, as showed in Figure 1, panel A, other capacities having higher marginal costs frequently have to meet the demand. In this case, the average annual effect on prices can be significant. On the other hand, the effect on prices will be negligible when the removal refers to production units having relatively high marginal costs (see Figure 1, panel B). In this incident, a price effect only emerges when the market is tight, that is, if total demand exceeds the aggregated capacity of all other production units. Although such a price effect can be relatively strong because of the scarcity effect in these hours, on an annual basis the price effect is likely modest.

From this brief theoretical analysis, we learn that, to estimate the price effect of the closure of the power plants, we have to determine the relative marginal costs as well the level of total demand during a certain period of time. For this purpose, the Energy Research Centre of the Netherlands (ECN) was requested by the ACM to make a quantitative analysis of the Dutch electricity market using a number of scenarios on the relative fuel prices and the level of electricity demand.⁴⁴ The Centre used the ECN model called POWERS, which is a micro-simulation model that describes the dispatch of all power

⁴⁴ ENERGY RESEARCH CENTRE OF THE NETHERLANDS, *supra* note 16.

plants available in the Dutch market given exogenous values for fuel prices, electricity demand, and supply coming from neighbouring countries.⁴⁵

The model distinguishes off-peak, peak, and super-peak periods each week of each year. For every period, the electricity price is determined as an endogenous variable resulting from the restriction that the demand should be equal to the aggregated supply from domestic generators and net import. The level of demand is exogenously determined based on scenarios regarding economic growth, demographic development, changes in the economic structure, policy measures for energy savings, as well as seasonal and daily patterns. The model estimates the demand for electricity for 7 different consumer groups: households, services and government, transport, manufacturing, agriculture, refineries, and gas industry.

The supply side includes all existing centralized production units. For each unit the model takes into account the key technical and economic characteristics, such as electrical capacity, electrical and thermic efficiency, type of fuel, and level of variable operating costs. In addition, the supply side of the model describes the production by decentralized Combined Heat and Power (CHP) units as well as large-scale renewable capacity (depending on the scenario). The supply side includes also the net supply curves from neighbouring countries. These curves are based on the marginal production costs in the neighbouring countries. By including import and export, the model guarantees that cross-border effects are taken into account, although the national market is still considered the relevant market. Note that the magnitude of the cross-border effects depends on the size of the import and export capacity to Germany, Norway, Belgium, the United Kingdom as well as the net supply curves in these countries.⁴⁶

Because of this level of detail, the model is able to mimic the actual merit order in the Dutch market and how this merit order changes when plants are closed. The inclusion of import and export relationships transfers the price effects of domestic events, such as the closure of the coal-fired power plants, to the neighbouring countries, so reducing the domestic effect.

B. Scenarios

The first step in the quantitative analysis is to define the scenarios on external circumstances—in particular, the fuel prices and growth of electricity demand. Our Baseline Scenario is equal to the baseline scenario ECN/PBL used in the

⁴⁵ See ENERGY RESEARCH CENTRE OF THE NETHERLANDS, KERNCENTRALE BORSSELE NA 2013: GEVOLGEN VAN BEEINDIGING OF VOORTZETTING VAN DE BEDRIJFSVOERING 123–33 (2005).

⁴⁶ The relevance of cross-border connections for the Dutch market follows from the fact that changes in these connections explain for about 1/3 the change in the intensity of competition in this market over the period between 2006 and 2011. See, e.g., Machiel Mulder & Lambert Schoonbeek, *Decomposing Changes in Competition in the Dutch Electricity Market Through the Residual Supply Index*, 39 ENERGY ECON. 100 (2013).

Table 1. Assumptions on fuel prices, electricity demand and offshore wind parks (Baseline Scenario)

	2016	2017	2018	2019	2020	2021	2022	2023
Price of coal (euro/GJ)	3.3	3.3	3.4	3.4	3.4	3.4	3.5	3.5
Price of gas (euro/m ³)	0.245	0.258	0.27	0.282	0.293	0.299	0.304	0.309
Price of CO ₂ (euro/ton)	8.4	9.0	9.6	10.2	10.8	11.7	12.6	13.5
Electricity demand (TWh)	124.1	125.3	126.5	127.8	129.2	128.9	128.7	128.4
Offshore wind (GW)	0.958	0.959	1.359	2.109	3.542	3.5	3.5	5.4

Source: ECN (2013), *supra* note 16.

overall assessment of the Energy Deal.⁴⁷ In addition, we define a number of alternative scenarios as a sensitivity check. The alternative scenarios refer to alternative assumptions regarding the further development of offshore wind parks as well as the prices of gas, coal, and CO₂. Note that the level of demand is the same in all scenarios. All scenarios refer to the period between 2016 and 2021 as, in the absence of the Agreement, the first closure of a plant is expected to occur in 2016 and the last one in 2021. We add two years to the period of analysis (2022 and 2023) to see whether there will be any effect after the closing of the last plant.

The Baseline Scenario assumes that the price of coal will increase slightly from €3.3 per GJ in 2016 to €3.5 per GJ in 2023, while the price of natural gas rises from €0.245 per meter³ in 2016 to €0.309 per meter³ in 2023 (Table 1). These assumptions are based on long-term price projections recently made by the PBL/ECN.⁴⁸ As the relative fuel prices may have a significant effect on the relative position of different plants in the merit order, we define Alternative Scenario I in which we assume that both the price of coal and the price of gas remain on the 2016 level, resulting in relatively lower gas prices (Table 2).

Regarding the price of CO₂ permits, we assume that this price will increase from €8.4 per ton in 2016 to €13.5 per ton in 2023. Because this price affects the relative position of different type of plants in the merit order, it is important also to analyze the sensitivity of the results to a different assumption. Therefore we define Alternative Scenario II in which the price of CO₂ permits

⁴⁷ ENERGY RESEARCH CENTRE OF THE NETHERLANDS, NETHERLANDS ENVIRONMENTAL ASSESSMENT AGENCY, HET ENERGIEAKKOORD: WAT GAAT HET BETEKENEN? 10–12 (2013).

⁴⁸ ENERGY RESEARCH CENTRE OF THE NETHERLANDS, NETHERLANDS ENVIRONMENTAL ASSESSMENT AGENCY, REFERENTIERAMING ENERGIE EN EMISSIES: ACTUALISATIE 2012 17 (2012).

Table 2. Assumptions on gas and coal prices in Alternative Scenario 1

	2016	2017	2018	2019	2020	2021	2022	2023
Price of coal (<i>euro/GJ</i>)	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
Price of gas (<i>euro/m³</i>)	0.228	0.228	0.228	0.228	0.228	0.228	0.228	0.228

Source: ECN, *supra* note 16.

Table 3. Assumptions on the price of CO₂ in Alternative Scenario II

	2016	2017	2018	2019	2020	2021	2022	2023
Price of CO ₂ (<i>euro/ton</i>)	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0

Source: ECN, *supra* note 16.

stays at the present level of about €5 per ton (Table 3). Note that for the other variables, this scenario is equal to the Baseline Scenario.

The merit-order effect also depends on the presence of other types of power plants, in particular wind parks. The higher the size of total installed wind capacity, the less the conventional plants will be dispatched, given the fact that the marginal costs of wind electricity are negligible, placing wind parks at the left side of the supply curve. In the Baseline Scenario we assume that the total installed generation capacity of offshore wind parks will develop according the objectives of the parties in the Energy Deal. This means that the offshore-wind capacity will increase from about 1 GW in 2016 to about 5 GW in 2023. To place these numbers in perspective: 5 GW is 5000 MW, which is twice as much as the aggregated capacity of the 5 coal-fired power plants that are subject to the Agreement. In the Alternative Scenario III we assume that the deployment of wind parks will be less successful, resulting in a growth of 0.2 GW in 2016 to 4.4 GW in 2023 (Table 4).

C. Results

Having defined the scenarios, we are able to determine the impact on both prices and environment of advancing the closure of the 5 coal-fired power plants by a few years earlier. This calculation is done by first analysing, for each of the above scenarios, the electricity price (on the day-ahead wholesale market) when these plants remain in operation until their initially expected year of closure and then doing the same analysis under the assumption of the earlier closure of the plants. The difference in the electricity price between these two variants is the price effect of the Agreement.

On average, the wholesale electricity price rises by €0.6 per MWh in the Baseline Scenario, which is about 1 percent (Table 5). From year to year, the price impact differs as a result of the changing relative positions of power

Table 4. Assumptions on the size of offshore wind parks in Alternative Scenario III

	2016	2017	2018	2019	2020	2021	2022	2023
Offshore wind (GW)	0.228	0.928	0.928	1.378	1.978	2.7	3.5	4.4

Source: ECN (2013), *supra* note 16.

Table 5. Effect of advancing the closure of 5 coal-fired power plants on the electricity wholesale price (in euro/MWh, on average per year, per scenario)

Scenarios	2016	2017	2018	2019	2020	2021	2022	2023
Baseline scenario	0.4	0.2	0.1	0.7	0.6	1.5	0.0	0.0
Alternative Scenario I (lower fuel prices)	0.5	0.7	0.4	0.7	0.5	0.5	0.0	0.0
Alternative Scenario II (lower CO ₂ price)	0.2	0.1	0.9	0.7	0.5	1.4	0.0	0.0
Alternative Scenario III (less offshore-wind capacity)	0.7	0.3	0.1	0.5	0.5	1.1	0.0	0.0

Source: ECN (2013), *supra* note 16. The electricity wholesale price in the Baseline scenario is about 65 euro/MWh.

plants. In particular the relatively large price increase in 2021 can be attributed to the fact that coal has become relatively cheap by then (in this scenario), which makes coal-fired power plants more important. As a result, closure of these plants has a relatively large effect. In the Alternative Scenarios, the price impact differs from year to year, but the average effect over the whole period of analysis is not strongly affected: in all scenarios the electricity prices increases on average by about €0.6 per MWh.

To arrive at an estimate of the loss of consumer surplus we have to quantify the volume of the consumption that is affected by this price increase. From Table 1, we see that the aggregated level of estimated future electricity consumption in the Netherlands during the period of analysis increases from 124 to 128 TWh. When we multiply the annual price increase by the total estimated Dutch electricity consumption, we arrive at a loss of consumer surplus of on average 75 million euro per year in the Baseline Scenario. In the Alternative Scenarios the average annual loss of consumer surplus is slightly lower (70 for I and III) or slightly higher (80 for II). This loss partly refers to the increase in electricity expenditure by consumers, assuming that the rise in the wholesale price is passed on to the retail price. This is a valid assumption, given that the Dutch energy retail market, liberalized in 2004, has become fairly competitive with many options for consumers to choose from. Although inactive energy consumers may pay relatively high prices, for active consumers their retail price is strongly related to the underlying wholesale price.⁴⁹ In addition, the decline in consumer surplus also refers to the increase in the price of

⁴⁹ See Machiel Mulder, *De relatie tussen consumenten en energiemarkt onder spanning*, 99 ESB ECONOMISCH STATISTISCHE BERICHTEN 50 (2014).

electricity, which is used as an input for the production of other goods and services and will in turn also affect the prices thereof.⁵⁰

V. ENVIRONMENTAL BENEFITS

From the legal framework, we learned that one of the conditions to fulfill is to have sufficient benefits for the consumers that bear the costs of the agreement—that is, the consumers in the relevant market. As this group consists of all inhabitants of the Netherlands, we have to analyze to what extent they benefit from the environmental effects of the Agreement. To estimate the benefits, we first analyze the impact on the volume of the environmental emissions and then try to monetize these unpriced effects.

A. Magnitude of Environmental Effects in Physical Terms

The impact on the volume of the emissions for SO₂, NO_x, and small particulate matter (PM) follows directly from the POWERS model as this model includes all relevant technical characteristics of each plant in the Dutch electricity market (Table 6). Although the POWERS model also calculates the direct effect on the emissions of CO₂, this result does not refer to the ultimate impact on emissions of this greenhouse gas because of the existence of the European Emissions Trading Scheme (ETS). The ETS is a cap-and-trade scheme, meaning that the aggregated level of emissions of all firms participating in this system is capped by a ceiling, while each of the firms has the option to trade in order to buy or sell emission permits. In principle, the cap is meant to realize an overall emission reduction, while the possibility to trade is meant to improve the efficiency by which this reduction is realized. All major electricity firms in Europe are bound to participate in the ETS. Because of this, these firms can use any emission reduction they realize to either sell the permits they do not need any more or decide to buy less permits. In both cases, the only effect of an emission reduction the electricity firms realize is that the permit price declines to equalize the aggregated level of emissions to the cap. Hence, there is no net effect on emissions of CO₂, only an effect on the costs of emission reductions, which have to be made within the ETS.⁵¹ Below we will discuss how to value this effect.

⁵⁰ Although a part of the domestic electricity consumption is used to produce goods for exports—which implies that part of the price increase is also exported—the price of many imported goods will also rise because the electricity price in our neighbouring countries will also rise as result of the international integration of the electricity markets. Note, however, that legally the notion of “consumers” refers to all buyers of a good, including businesses, which means that we may use the total domestic consumption of electricity as the measure of the volume of goods which price is affected.

⁵¹ A temporary effect on CO₂ emissions occurs if firms wait to sell the surplus of permits resulting from the closure of the power plants. Such a delay may happen when firms expect that the permit price will rise with an annual percentage that is higher than the level of the applicable

Table 6. Reduction of emissions of CO₂, SO₂, NO_x and small particulate matter as a result of advancing the closure of 5 coal-fired power plants (per year, per scenario)

	2016	2017	2018	2019	2020	2021	2022	2023
CO₂ (Mton)*								
Baseline	4.1	3.4	5.7	5.9	4.5	4.7	0.0	0.0
<i>Alternative Scenarios:</i>								
I	8.4	3.3	3.6	4.4	2.1	3.9	0.0	0.0
II	5.8	3.0	5.8	5.9	4.9	5.3	0.0	0.0
III	5.7	3.0	5.4	6.2	4.4	4.9	0.0	0.0
SO₂ (kton)								
Baseline	2.0	1.6	2.4	2.4	1.8	1.9	0.0	0.0
<i>Alternative Scenarios:</i>								
I	2.7	1.4	2.0	2.0	1.6	1.5	0.0	0.0
II	2.6	1.4	2.4	2.4	2.0	2.0	0.0	0.0
III	2.8	1.5	2.3	2.6	1.8	1.9	0.0	0.0
NO_x (kton)								
Baseline	1.4	1.3	1.9	1.9	1.3	1.4	0.0	0.0
<i>Alternative Scenarios:</i>								
I	3.6	1.5	0.8	1.3	-0.1	1.1	0.0	0.0
II	2.0	1.2	2.0	2.0	1.5	1.8	0.0	0.0
III	1.9	1.2	1.8	2.1	1.2	1.5	0.0	0.0
Small particulate matter (PM) (kton)								
Baseline	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
<i>Alternative Scenarios:</i>								
I	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
II	0.1	0.0	0.1	0.1	0.1	0.1	0.0	0.0
III	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0

Source: ECN, *supra* note 16.

*The numbers refer to the direct effect—that is, the effect on the emissions by the Dutch electricity producers. The indirect effect is zero because of the existence of the European Emissions Trading system.

B. Monetization of Environmental Effects

The effects of emissions on the environment are called unpriced effects, which implies that we have to monetize them in order to be able to include these effects in the cost-benefit analysis. The theoretical underpinning of the monetization is given by the Hicksian compensating variation, which is the change in income needed to compensate for a change in relative prices—that is, the

discount factor during the remaining years of the current allocation period, making it profitable for them to postpone the revenues of selling the permits. As a result, the current level of emissions would reduce, but the (near) future level of emissions would increase. Given the huge uncertainty about the precise impact of emissions on climate change, it is impossible to monetize the environmental effect of such a time shift. In addition, the effects for Dutch consumers would in any case be negligible as will be discussed later on in this section.

prices of the different goods—to maintain the initial level of utility.⁵² This compensation variation can be seen as the amount consumers are willing to pay as compensation for an improvement—for example, in the environment—or the amount consumers require as compensation for damage to the environment. The first amount is the willingness-to-pay (WTP) and the second one the willingness-to-accept (WTA). The economic literature offers a number of valuation techniques for these WTP and WTA. These techniques can be distinguished in direct and indirect valuation methods.⁵³

In the indirect valuation methods, the value of a non-priced good is derived from the value of another good which has a market price. Hence, these methods use revealed preferences, albeit not directly on the unpriiced good. A clear example of this method is the travel-cost method, which measures how much travel costs people are making for visiting a natural park for example. Another example is the hedonistic-pricing method, in which, for instance, the value of a natural park is derived from the relative prices of houses in the neighbourhood of that park compared to prices of houses in other regions. A caveat of the indirect valuation method is that it can only be used when a direct relationship exists between the consumption of both goods: the priced and the unpriiced one.

The direct valuation methods consist of techniques by which consumers are directly asked what value they attach to a specific good. These values may in principle be of any type, varying from use-value, existence value to option value. One of the techniques in this category is the contingent valuation method (CVM), in which respondents are asked to reflect on different hypothetical situations. Another example is choice (conjoint) modelling in which individuals are asked to choose from a number of options that have several environmental attributes as well as a monetary payment (that is, the price which has to be paid). Note that these direct valuation methods are characterized by using so-called stated preferences.

Another direct valuation method is based on production functions, meaning that they try to estimate the impact of an environmental change on consumers. This method is also called the dose-response method or damage-cost method, which means that the effect is estimated of an emission (that is, the dose) on for instance health of citizens (that is, the response). Another method in this category is the avoided-cost method, which measures the WTP or WTA on the basis of the costs which do not have to be made anymore. This method can be used when policy targets exists, since the value of any measure directed at realizing those targets can be derived from the costs, which do not have to be made anymore for that purpose. Note that the policy targets can be seen as the reflections of long term social preferences, that is, the WTP of the

⁵² See, e.g., HAL R. VARIAN, *INTERMEDIATE MICROECONOMICS; A MODERN APPROACH* (6th ed. W.W. Norton & Co. 2003); PERMAN, MA, MCGILVRAY & COMMON, *supra* note 19, at 254–60.

⁵³ See, e.g., AGNAR SANDMO, *THE PUBLIC ECONOMICS OF THE ENVIRONMENT* 68–89 (Oxford Univ. Press 2000).

society for realising these targets, making it unnecessary to conduct a WTP research among consumers. Put differently, the marginal costs of reaching policy goals (following from the avoided-cost method) can be seen as the marginal value, or price, which in society is attributed to these goals. Note also that in both the damage-cost method and the avoided-costs method, the monetization is based on the marginal value, which is similar to how the value is determined of market-traded goods.

Which method of valuation should be used for a specific environmental effect depends on both the physical characteristics of the effects and the type of environmental policies implemented. In the case of emissions of gas, the indirect valuation method cannot be used because no clear relation exists between the environmental effect thereof and the prices of specific market goods. The damage-cost method or the avoided-cost method is generally used in this case. The latter should be used where explicit policy objectives exist.⁵⁴ Because of the existence of these targets, an emission reduction does not result in an environmental effect, but has as effect that less other reduction measures have to be taken to realise the targets. Hence, the benefits consist of savings made on other environmental measures. For SO₂ and NO_x, the Dutch government has formulated policy targets. Therefore, we use the avoided-cost method. The benefits of any reduction of emissions of these gasses are equal to the marginal costs of reaching the policy target. For small particulate matter, the Dutch government has not formulated a target, which implies that any reduction in the emission results in less environmental damage. Hence, we estimate the value of these reductions by the damage-cost method.

For CO₂, the European Union implements a policy target as the permit cap in the European Emissions Trading Scheme. The permit price in this system can be seen as the shadow price based on the avoided-cost method. This means that the (only) benefit of an emission reduction following from the earlier closure of the coal-fired power plants is that less other emission-reduction measures have to be implemented within the ETS domain. The value of this effect is equal to the permit price times the emissions reduction presented in Table 6. This benefit, however, is enjoyed by all ETS participants in Europe, a group which is significantly bigger than the group of Dutch consumers who are affected by the increase in the electricity price. Therefore, following our legal framework, ACM did not take these benefits on board in the analysis.

We use the Shadow Prices Handbook of CE as our primary source for determining the values of the shadow prices. This handbook, which has been made on request of the Dutch government, plays a major role in economic analysis of

⁵⁴ SANDER DE BRUYN, MARISA KORTELAND, AGNIESZKA MARKOWSKA, MARC DAVIDSON, FEMKE DE JONG, MART BLES & MAARTJE SEVENSTER., CE DELFT, SHADOW PRICES HANDBOOK: VALUATION AND WEIGHTING OF EMISSIONS AND ENVIRONMENTAL IMPACTS 47–60 (2010).

Table 7. Shadow prices of environmental effects

Environmental effect	Method of valuation	Price (euro/ton)
CO ₂	Prevention	8.4–13.5 (see table 1)
SO ₂	Prevention	5,400
NO _x	Prevention	9,400
Small Particulate Matter (PM10)	Damage	44,300

Source: See CE, SHADOW PRICES HANDBOOK, VALUATION AND WEIGHTING OF EMISSIONS AND ENVIRONMENTAL IMPACTS (Delft 2010). The values have been inflated to 2012 euros by using a 2-percent rate of inflation.

Table 8. Effect of advancing the closure of 5 coal-fired power plants on consumer surplus (in million euros per year, on average between 2016 and 2021)

Scenario	Expenditures on electricity	Environmental benefits	Net effect on consumer surplus
Baseline	75	30	–45
Alternative scenario I (lower fuel prices)	70	25	–45
Alternative scenario II (lower CO ₂ prices)	81	32	–49
Alternative scenario III (less offshore wind capacity)	68	31	–37

Source: Author's own calculations.

policy projects where unpriced effects have to be monetized.⁵⁵ In Part VI, we conduct a sensitivity analysis on the shadow prices. Table 7 gives an overview of the method of valuation per gas and the respective shadow prices.

Using the shadow prices mentioned in Table 7 and the reductions in the volume of the emissions for SO₂, NO_x, and small particulate matter which are given in Table 6, we are able to calculate the total benefit for consumers of these reductions. In the baseline scenario the annual average value of the benefits appears to be €30 million. In the alternative scenarios the benefits are slightly lower or higher.

VI. NET EFFECT ON CONSUMERS

A. Results

Having calculated both the increase in consumer expenditures because of the rise in the electricity price and the environmental benefits, we are able to determine the overall effect on consumers. Table 8 shows that in all scenarios the

⁵⁵ See, e.g., VERRIPS ANNEMIEK, HAGE DE VRIES, AD SEEBREGTS & MARK LIJESSEN, CPB NETHERLANDS BUREAU FOR ECONOMIC POLICY, WIND TURBINES AT THE NORTH SEA: A SOCIAL COST BENEFIT ANALYSIS 78–81 (2005).

net effect on consumer surplus is negative and varies between €37 million per year to €49 million per year.

In the scenario where in particular the gas price is lower (Alternative Scenario I), we see that both the impact on consumer expenditures and the environmental benefits are lower than in the Baseline scenario. This is result of the fact that in this scenario gas-fired power plants are relatively more dispatched and as a result, the earlier closure of the coal-fired plants has a smaller impact. After all, owing to the lower gas price compared to the coal price, coal-fired units have become relatively less commercially attractive. We find the opposite effect when the carbon permit price is lower (Alternative Scenario II). In that scenario, coal-fired power plants have a relatively more profitable business-case, which means that an earlier closure of these plants results in higher costs for consumers, but also in more environmental benefits. As a result, the net effect on consumer surplus does not change much.

The net effect on consumer surplus is somewhat smaller when the offshore wind parks show a less successful development compared to what is assumed in the Baseline scenario. In this scenario, gas-fired power plants are relatively more important while the dispatch of coal-fired plants is hardly affected as they are still in the middle of the merit order. Because of the latter, the environmental effects are about equal in both scenarios. The impact on prices and consumer expenditures becomes, however, smaller when there are less wind-power plants owing to the fact that in this scenario coal-fired plants are less frequently price-setting plants. Hence, having more wind parks makes the closure of the coal-fired power plants more costly for consumers, while the environmental benefits are hardly affected.

B. Sensitivity Analysis

In order to test whether the above findings change when we make different assumptions regarding the calculation of the valuation of the economic and the environmental effects, we conduct a sensitivity analysis. The above analysis of the price effects is conducted with the ECN POWERS model, as described in part IV. The results of this model result from the merit-order effect in the Dutch market plus the cross-border effects with the neighbouring countries. In order to obtain an impression of the pure merit-order effect, we use an alternative approach with hourly generation data of all centralized power plants. By using this data, the actual hourly merit order in the Dutch market can be determined. By combining these merit orders with the actual total level of load, we are able to determine the hourly system marginal costs, which are the marginal costs of the highest placed plant in the merit order which is needed to satisfy demand.⁵⁶ If we remove the 5 coal-fired power plants subject to the

⁵⁶ See Machiel Mulder, *Competition In The Dutch Electricity Market: An Empirical Analysis Over 2006–2011*, 36 *ENERGY J.* 1, 1–28 (2015) (for more detail on the data and the model).

Table 9. Sensitivity analysis: net effect consumer surplus of different assumptions in the Baseline scenario (in million euros per year, on average in 2016–2021)

Variant	Net effect on consumer surplus
Price effect based on pure merit-order effect	–97
Alternative sources for the values of the shadow prices	–67
All shadow prices based on damage costs	–20

Agreement from the merit order, we find an average annual price effect of 2.2 percent. If we assume that new plants having an aggregated capacity of 2000 MW will be installed while the electricity demand grows by 2 percent per year, we find an average annual price effect of 2 percent. These results show that price effect of the Agreement is more than twice as big if we would ignore the cross-border effects. Applying this pure merit-order effect in the calculation of the impact on consumer surplus, we find an annual average effect of €–97 million (Table 9). This means that taking into account the interaction with neighbouring countries reduces the costs for consumers strongly.

The shadow prices for the environmental effects are based on CE. The shadow prices referring to the marginal abatement costs differ between countries, depending on the policy targets on the one hand and the abatement options on the other. Mekaroonreung and Johnson,⁵⁷ for example, find for coal-fired power plants in the U.S. that the marginal abatement costs for SO₂ vary between 201 and \$343 per ton and for between 409 and \$1352 per ton NO_x. Also for the US power plants, Rezek and Campbell find marginal abatement costs of \$290/ton for SO₂ and \$920 per ton for NO_x.⁵⁸ We take the highest of these values in the sensitivity analysis, assuming exchange rate parity between dollar and euro, which results in €343 per ton for SO₂ and €1352 per ton for NO_x. In order to find an alternative value for the shadow price for small particulate matter, we use the results of the Cost Assessment of Sustainable Energy System (CASES) project.⁵⁹ In this project, the shadow prices based on damage costs are calculated for all European countries. For small particulate matter, they find a shadow price for the Netherlands of €57,600 per ton. Using these alternative values for the shadow prices of the environmental effects, we arrive at a net effect on consumer surplus of €67 million per year.

⁵⁷ Maethee Mekaroonreung & Andrew L. Johnson, *Estimating the Shadow Prices of SO₂ and NO_x for U.S. Coal Power Plants: A Convex Nonparametric Least Squares Approach*, 34 ENERGY ECON. 723, 723–32 (2012).

⁵⁸ Jon P. Rezek & Randall C. Campbell, *Cost Estimates for Multiple Pollutants: A Maximum Entropy Approach*, 29 ENERGY ECONOMICS 503 (2007).

⁵⁹ CASES is a Coordinated Action funded by the European Commission under the Sixth Framework Programme, PRIORITY 6.1.3.2.5, Sustainable Energy Systems. For CASES data, see COST ASSESSMENT FOR SUSTAINABLE ENERGY SYSTEMS, CASES, http://www.feem-project.net/cases/downloads_presentation.php.

One may also discuss the plausibility of the chosen method for calculating the shadow prices. For SO_2 and NO_x , the shadow prices refer to the marginal abatement costs because of the existence of policy targets for these emissions. Implicitly, we assume here that the policy targets restrict actual emissions, meaning that these targets are below actual emission levels. In that case the shadow price needs to be determined by the avoided-cost method. However, if the targets are not restricting, there is no impact of any further emission reduction on other reduction measures, implying that the appropriate value of the shadow price is zero. This would bring the environmental benefits for these gasses to zero as well. On the other hand, any reduction realised may not be offset by an increase in emissions elsewhere, which means that the damage-cost method should be used to value these emissions. These shadow prices are about twice as high. CE (2010) reports as shadow prices based on damage costs €11400 per ton NO_x and €16700 per ton SO_2 . If we apply these, the net effect on consumer surplus would reduce to levels of about €– 20 million per year, which is still a negative welfare effect.

Finally, one may assume that consumers have a preference for more green energy above the so-called grey energy. In a recent OECD study,⁶⁰ the WTP for green energy has been analyzed. For the Netherlands, this study finds an average WTP for green energy of 7.5 percent of the energy expenditure, which is relatively low compared to many other countries. It also appears that about 60 percent of the Dutch energy consumers are not prepared to pay anything extra for renewable energy. We can, however, disregard the precise value of the WTP for green energy among Dutch consumers. This value is not relevant in our case since the Agreement does not directly affect the availability of green energy. Although developing offshore wind parks is also part of the Energy Deal, this part is not necessarily connected to the closure of the coal-fired power plants. Therefore, we conclude that the Agreement does not create additional benefits related to the greening of the electricity supply.

Overall, we find in our sensitivity analysis some different results regarding the net effect on consumer welfare, but in all cases this effect remains negative.

VII. CONCLUSIONS

A. Dealing with Environmental Benefits in a Competition Analysis

We have elaborated on the approach that the ACM followed in assessing the proposed agreement of Dutch electricity producers to advance the closure of a number of coal-fired power plants. Although it may be argued that the case law on inherent restrictions also applies to competition-reducing agreements which are meant to enhance sustainability, ACM analyzed the expected environmental benefits within the framework of the efficiency defence. Applying the inherent

⁶⁰ OECD STUDIES ON ENVIRONMENTAL POLICY AND HOUSEHOLD BEHAVIOUR, GREENING HOUSEHOLD BEHAVIOUR, OVERVIEW FROM 2011 SURVEY (OECD rev. ed. 2014).

restrictions approach would probably widen the scope for allowable agreements for the purpose of sustainability. Consequently, the ACM follows a more narrow approach in which environmental benefits resulting from a competition restrictive agreement can, in specific circumstances, be taken into account in the assessment of such an agreement. The antitrust community is in general reluctant to take issues on board that often are labelled as non-economic, non-competition or non-efficiency considerations. The fear is that this could damage the effectiveness, consistency and predictability of antitrust policy. We agree that a caution in this respect is demanded. It is, however, common ground that environmental benefits can be taken into account in an efficiency defence when they can be translated into economic benefits.⁶¹

The approach in the present case starts from the presumption that the goal of competition law is to promote an efficient allocation of resources and thus, welfare. It is consistent with this goal to include, under certain conditions, environmental considerations in an efficiency defence. So, note that it is essential that the genuine purpose of a competition-restricting agreement is to reduce the negative environmental effects of their activities.⁶² Within economic science there is nothing controversial about this approach or about the so-called broad welfare criterion on which it rests. This approach goes back to the 1920s with Pigou's masterpiece on welfare and economics.⁶³ Since then, the economic science has provided a number of techniques on the valuation of the environmental effects. As a result, including environmental effects in an economic analysis of, for instance, infrastructure projects has become the standard procedure.⁶⁴

Moreover, ACM followed a cautionary approach. As was shown above, ACM adhered to the distributional condition which is implied in the second condition of section 6(3) Mw and article 101(3) TFEU, as interpreted by the European Commission.

B. Application of the Framework on the Energy Deal

Based on this legal framework, we have analyzed the effects of the agreement of the Dutch electricity producers to advance the closure of 5 coal-fired power

⁶¹ FAULL & NIKPAY, *supra* note 33, ¶¶ 3.12–3.14; KINGSTON, *supra* note 24, at ch. 5.

⁶² Note that the Policy Rule is directed towards agreements that have been made for *the purpose of* sustainability. See Policy Rule, *supra* note 10, § 2. This does not include the situation of, for example, a hard core cartel with beneficial side effects for the environment.

⁶³ ARTHUR C. PIGOU, *THE ECONOMICS OF WELFARE* (1920), <http://www.econlib.org/library/NPDBooks/Pigou/pgEW.html>.

⁶⁴ For the Netherlands, this standard procedure is described in the so-called OEI-guideline which describes the method of conducting costs-benefit analysis of infrastructure projects. See CAREL J.J. EIJGENRAAM, CARL C. KOOPMANS, PAUL J.G. TANG & A.C.P. (NOL) VERSTER, MINISTRY TRANSP., MINISTRY ECON. AFF., *EVALUATIE VAN INFRASTRUCTUURPROJECTEN: LEIDRAAD VOOR KOSTEN-BATENANALYSE* (Evaluation of Infrastructure: Guide For Cost-Benefit Analysis) (2000).

plants. We find that the environmental benefits are significantly smaller than the rise in consumer expenditures on electricity. Hence, based on this analysis we cannot conclude that the agreement on the early closure of the coal-fired power plants would be in line with competition law.

Obviously, the costs that result from the closure of the power plants spill over to a certain extent to neighbouring geographic markets, but these effects are limited. The environmental benefits, however, will far stronger be distributed to other countries. The benefit of reducing the emission of CO₂ is enjoyed by all ETS participants in Europe and could therefore not be taken into account. A similar way of reasoning should be followed if a number of permits reflecting the emission reduction were withdrawn from the market, for instance by cancelling these permits at the Dutch Emissions Authority. In that case, a real environmental benefit would be realized, equal to the magnitude of the CO₂ emissions involved times the damage value of these emissions. From CE (2010) we can see that damage value may be much higher than the permit price in the ETS. Nevertheless, the value of the environmental benefit for the Dutch consumer would be negligible as this benefit is shared with all consumers on global level.⁶⁵ This illustrates in a very simple way the prisoner's dilemma of climate policy: without cooperation on a global level, climate policy is not efficient for individual countries.⁶⁶

Consequently, the second condition of article 101(3) TFEU limits the scope for self-regulatory arrangements that aim to deliver environmental benefits, especially when the benefits are spread over a large group of individuals while a much smaller group of consumers bears the costs. From this perspective, we conclude that in the present state of competition law agreements between private undertakings may often not be the best means to achieve environmental objectives.

Furthermore, also the third condition of article 101(3) is important for the assessment of the present case. Only efficiencies that cannot be realised by market parties in the absence of the restriction of competition (or by means of a less-restrictive agreement) can be included in a defence. For instance, the Agreement may also contribute to policy targets on the share of renewable energy in the total energy mix. This effect in itself, however, cannot be seen as a separate benefit of the agreement because the decisions of energy firms and consumers on the energy mix are not hindered by market failures. In other words, each individual firm may decide to change its generation portfolio from coal-fired power plants into the direction of more renewable generation techniques.

⁶⁵ Using a shadow price based on the marginal damage value of say €100 per ton, the total (annual) benefits of reducing 4.5 Mton would be €450 million on a global level. Assuming an equal allocation of this benefit among the global inhabitants, the Dutch share of the benefit would be $17 \text{ million} \div 7 \text{ billion} \times €450 \text{ million} = €1 \text{ million}$.

⁶⁶ See SCOTT BARRETT, *WHY COOPERATE? THE INCENTIVE TO SUPPLY GLOBAL PUBLIC GOODS* (Oxford Univ. Press 2007).

In spite of the negative outcome for the Agreement, this case shows that it is possible to include environmental benefits in a competition analysis on the basis of sound economics, thereby staying within the limits of the applicable legal framework.