

Taking care of optimal energy-distribution networks

The regulator's vision of the regulatory framework

Office of Energy and Transport Regulation – the Netherlands Competition Authority

Executive summary

Impending energy transition calls for re-evaluation of regulatory framework

The energy industry is facing major changes. In the next few years, substantial investments are needed due to the gradual depletion of domestic natural-gas supplies, the necessity to replace fossil fuels with renewable energy sources, and the necessary replacement of aged network segments. Having the right regulatory framework is therefore vital in bringing about a smooth energy transition.

Current regulatory framework has been successful

In order to find out to what extent the current regulatory framework has been satisfactory, the Netherlands Competition Authority (NMa) commissioned three research agencies: Movares Nederland (Movares), Kiwa Gas Technology (Kiwa) and PricewaterhouseCoopers Advisory (PwC). Having carried out a study, they found that network operators so far have been able to make all the necessary investments. The regulatory framework stimulated the networks operators to work more efficiently, but it did not lead to any necessary investments being postponed. Not a single operator has abandoned any investment plans because of a lack of funds. Furthermore, the study also reveals that there are no indications that the quality of the regional networks for electricity and natural gas have deteriorated in recent years. In fact, their quality continues to be high, even by international standards.

Aiming for a stable, yet flexible regulatory framework

The NMa believes it would be wise to keep intact the general principles of the regulatory framework currently in place. After all, having a stable regulatory framework is essential to network operators and their investors, assuring them that they will be able to recover the costs of their (efficient) investments, while the networks' users are guaranteed that tariffs continue to be cost-oriented. However, when specifying the regulatory framework, it is vital to be able to respond to new developments in the energy industry.

Making room for more flexibility

More room for flexibility will be made in the regulatory framework for more flexibility in order to take into account each individual network operator's specific circumstances. For example, it is conceivable that network operators will have to deal in varying degrees with energy developments, such as distributed generation or requests for electric-car charging stations, which will likely force them to adopt different investment patterns. The current regulatory framework already has the option of offering more room, in particular by allowing to incorporate special investments in the total revenues through the instrument of 'considerable investments'. The NMa, together with the Ministry of Economic Affairs, will be investigating to what extent and in what ways the use of this particular instrument can be expanded.

Shareholders play an equally crucial role

Of equal importance, besides having the right regulatory framework, is the availability of equity in order to finance large-scale investments. Network operators' shareholders therefore play an equally crucial role in ensuring that network operators are able to respond well to the needed energy-supply transition.

Summary

Background: the debate about the energy transition and the regulatory framework

1. The energy industry is facing major changes. In the next few years, substantial investments are needed due to the gradual depletion of domestic natural-gas supplies, the necessity to replace fossil fuels with renewable energy sources, and the necessary replacement of aged network segments. Both the energy producers and the network operators face these daunting tasks. What is needed, for example, are investments in distributed generation (such as micro CHP systems) that can add electric power to the grid, investments in grids enabling them to charge huge numbers of electric cars, and considerable investments in wind farms (onshore and offshore). In addition, numerous segments of the grids that are becoming old need to be replaced in the next few years. Having the right regulatory framework is therefore vital in bringing about a smooth energy transition.
2. Various parties, such as the Dutch Scientific Council for Government Policy (WRR, 2007) and the Dutch Energy Council (AER, 2009), have stated that the existing regulatory framework is inadequate for facilitating this transition in the energy industry. They argue that the regulatory framework so far has focused too much on efficiency and on tariff reduction at the expense of the necessary investments in, the maintenance of, and the expansion of the grids. Several key elements of the framework should therefore be revised in order to ensure that these investments can still be made. Instead of the current system where energy transport tariffs are based on the network operators' efficiency levels, there should be a system where the network operators have more (ex-ante) financial certainty when investing.
3. In 2009, the NMa already published its ideas on the future of network management regulation (NMa, 2009) as its contribution to the public debate on regulation. The NMa concluded that additional empirical research was needed into the regulatory framework's actual effects on necessary investments, particularly an empirical analysis into the effects on the grids' quality levels.
4. In 2009, the NMa commissioned three research agencies to carry out that empirical study: Movares Nederland (Movares), Kiwa Gas Technology (Kiwa) and PricewaterhouseCoopers Advisory (PwC). These research agencies met with all of the network operators, sat down with those closely involved with investment and financing decisions, and collected as much empirical data as possible on the factual quality of the grids and the actual investment behavior of the network operators. Although the empirical study also included looking into the national grid, this vision document however only relates to the distribution networks, both for electricity as for natural gas. The NMa is going to use this vision document's conclusions in its process of drawing up the method decisions for the upcoming regulatory period. In addition, the Dutch Ministry of Economic Affairs will use this document in its study into the revision of the regulatory framework.

The regulatory framework's effects so far: increased efficiency while the level of the grids' quality remains constant

5. The commissioned empirical study revealed that network operators so far have been perfectly able to make all the investments they had to make. Though the regulatory framework has indeed stimulated them to work more efficiently, it did not lead to any of the necessary investments being postponed. In addition, not a single operator has abandoned any investment plans because of a lack of funds.

6. Movares & Kiwa concluded there are no indications that the quality of the regional networks for electricity and natural gas has deteriorated in recent years. In fact, their quality level continues to be high, even by international standards. However, the study revealed that network operators lack a comprehensive picture of the grids' actual condition. This lack of sufficient reliable information is making it difficult for network operators to determine the right moment for making replacement investments. The researchers therefore believe that having a complete and reliable registration system of fixed assets is vital for effective and efficient network management.
7. PwC concluded there is no evidence that the regulatory framework has resulted in the necessary investments in the network being postponed or even being cancelled. The regulatory financial incentives have had no appreciably negative effect on the investments in quality and safety. The regulatory framework did result in the adoption of a more rational approach with regard to investment policy. Network operators have taken a more critical attitude towards investments, which in practice has led to the implementation of risk-based asset management, and to increased professionalization of operational processes. The study also revealed that the grid's quality and safety play a pivotal role in investment decisions. PwC does state however that current quality regulation, and the so-called q-factor (an efficiency-stimulating bonus-malus scheme in the tariff regulation) in particular, is insufficient for guaranteeing long-term grid quality. PwC concludes that the current regulatory framework's structure (yardstick regulation combined with quality control) does not pose a bottleneck, but that there is room for improvement with regard to its enforcement regarding reliability, accuracy, and quality guarantee.
8. However, past performance is no guarantee for future results, which also applies to the regulation of energy networks. The aforementioned energy supply transition will lead to more investments, which may even have a different risk profile than in the past. How will this affect regulation?¹. Knowing how the current regulatory framework works is essential in answering this question.

The characteristics of the current regulatory framework: benchmark regulation combined with quality control

9. The current regulatory framework is based on a couple of general principles. The first of these principles is that the regulator does not interfere with operational and investment decisions of the network operators, but that it sees to the statutory tasks being performed as efficiently as possible. Revenues are thus determined by the regulatory framework, while the network operators can decide on their own costs. Another principle of the current regulatory framework is that network operators must have the opportunity to make all the investments that are socially profitable or desirable, while at the same time not being forced to make investments that are neither. The regulatory framework thus has to provide for revenues that cover efficient costs, but it should offer no room for unnecessary investments nor for excessive profits. A third principle is that the regulatory framework does not only need to be focused on the network operators' revenues and the affordability for customers, but also on the quality of energy transport, and the security of energy supply. This combination of tariff regulation and quality control may help in bringing about optimal network management².

¹ This report does not touch upon all aspects of regulation in the future. Its focus is on investments, both replacement investments and other investments that are necessary to keep the energy networks in line with consumer and energy producer demands.

² International research papers underline this, such as Burger et al. (2008), Jbskow (2006), Pollit (2005), Ter-Martirosyna (2003).

10. One of the key elements of the current regulatory framework is the element of tariff regulation, which, on the one hand, aims to stimulate network operators to carry out their duties as efficiently as possible, and, on the other hand, to have customers reap the benefits thereof as much as possible. The chosen format of tariff regulation is yardstick regulation, meaning that the tariffs are based on a yardstick or benchmark. This benchmark is the average of all costs (per unit of output) of all network operators. Network operators that operate more efficiently than the average operator will thus earn higher profits, because they incur lower costs than others – and vice versa. A consequence of this form of benchmark regulation is that all of the network operators' costs are incorporated into the tariffs, but that each individual network operator will not necessarily be able to cover its own costs because that depends on the relative efficiency of each individual network operator.
11. Another element of the regulatory framework is quality control. It involves, among other things, the use of an efficiency-stimulating bonus-malus scheme, the so-called q-factor, making a network operator's total revenues dependent, in part, on the operator's actual quality performance. Network operators are additionally required to submit twice a year so-called quality and capacity documents (QCDs) to the NMa. In these QCDs, network operators are required, among other things, to explain what actions they will be taking to maintain their networks' reliability. Furthermore, the NMa, in close consultation with network operators and users, sets codes, which stipulate how network operators are supposed to behave towards each other and towards other parties connected to the networks. These codes also provide for compensation fees. In case of failures that last for more than four hours, network operators are required to compensate customers for these interruptions in transport.
12. In order to ensure that network operators operate efficiently, as well to ensure that the networks' quality continues to be high, the NMa regularly carries out studies into the network operators' actual situations. These studies are intended to reveal whether or not the revenues based on the tariffs lead to excessive profits, or to profits that are too low, meaning that operators are no longer able to finance necessary investments. In addition, the QCDs and the network operators' quality policies are frequently reviewed. The outcome of these reviews is used to bring tariff regulation and quality control in line with actual market conditions as much as possible.

Vision on regulation and energy transition: stability and flexibility

13. When thinking about changing the regulatory framework, a key principle in that process is that having a stable regulatory framework benefits both the network operators and customers. Having a stable regulatory framework is essential to network operators and their investors, assuring them that they will be able to recover the costs of their (efficient) investments, while the networks' users are guaranteed that tariffs continue to be cost-oriented. Amendments to the regulatory framework should only then be adopted when existing regulation clearly leads to negative effects.
14. The NMa believes it would be wise to keep intact the general principles of the regulatory framework that are currently in place. After all, the empirical study has revealed that the current regulatory framework so far has improved efficiency, and that it has not posed any obstacle for making the necessary investments. The combination of tariff regulation, where all efficient costs are covered,

and quality control acts as an incentive for network operators to working efficiently and to keeping an eye on the networks' reliability.

15. However, when specifying tariff regulation and quality control, having a certain degree of flexibility is crucial for being able to respond to new developments in the energy industry. That is why the NMa regularly analyzes the regulatory framework's effects on companies, examples of such analyses are the aforementioned studies into the profitability and financeability of investments. Furthermore, the NMa deliberately prefers the regulatory periods to be not too long, thereby enabling new developments to be included relatively fast in new method decisions. The focus on flexibility is further reflected in the considerable number of current activities, such as the regular updates of the compensation for the cost of capital (WACC) and the continuous study into the comparability of companies (table 1).
16. Next to the flexibility already currently available, additional flexibility may be needed to better take into account each individual network operator's specific circumstances. For example, it is conceivable that network operators will have to deal in varying degrees with energy developments, such as distributed generation, or requests for electric-car charging stations, which will likely force them to adopt different investments patterns. Network operators that need to make substantial investments therefore incur more costs that are not sufficiently covered through the current tariff regulation.
17. The current regulatory framework already has the option of offering more flexibility, in particular by allowing to incorporate special investments in the tariff composition in more cases through an expanded use of the instrument of 'considerable investments'³. It goes without saying that, in such cases, it is essential that there is a clear definition of what kinds of investments are considered 'considerable investments.' The NMa, together with the Ministry of Economic Affairs, will be investigating in what ways this instrument can be used to have the regulatory framework offer more room that may be needed in the future to guarantee that all of the necessary investments can be made.
18. Next to increasing flexibility in the regulatory framework, the NMa will continue to ensure the intensified quality control, which was started a couple of years ago, in order to maintain the currently high reliability levels of the electricity and gas networks. Based on the study's findings, it turned out that the regulation in the past offered insufficient guidance to network operators to reach optimal decisions regarding quality. Next to having a robust quality-control system, it is important that network operators themselves make additional steps regarding asset management. Network operators need to have a better picture of the actual quality of their networks, and they should make risk analyses and cost-revenue analyses more often.
19. Final thought: the network operators' shareholders are equally crucial in securing the network operators' ability to respond well to the necessary energy-supply transition. After all, financing substantial investments often requires additional equity capital. It is therefore imperative that

³ Or replacement investments, as mentioned in the Minister of Economic Affairs' proposal for amending the Dutch Gas Act and the Dutch Electricity Act.

shareholders not only focus on receiving dividends on the short term, but that they also take into account the network operators' future capital demand.

Table 1: Activities for improving the regulatory framework

| | Current activities | Long term |
|-----------------------------------|---|---|
| Tariff regulation | Continuous study into comparability of network operators | Studies into options to offer more flexibility in the current regulatory framework (together with the Ministry of Economic Affairs) |
| | Incorporating feed-in by distributed generation in the x-factors | Making an integrated assessment of the introduction of feed-in tariffs (Ministry of Economic Affairs) |
| | Study into network operators' profits | |
| Quality control | Possible adjustment of q-factor in method decision | Specification of requirements of quality control system |
| | Reviewing QCDs 2009 | Monitoring all quality aspects (transport quality, safety, product quality, and service quality) |
| | Enforcement based on QCDs 2007, particularly in connection with risk analysis and assets register | Improving product-quality reports |
| | Study into quality control for wholesale market | |
| Financing | Updating the parameters in the Method decisions, such as WACC | Increasing awareness among shareholders of their roles in realizing investments |
| | Study into financeability among network operators (Decision financial management) | |
| Innovation and experiments | Drawing conclusions after the consultation on innovation | |