

New agreements to enable energy transition

Standardisation as tool to accelerate transition towards low carbon energy system

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The energy transition not only involves a change in energy sources, but also a major change in the whole energy landscape, both physically and socio-economically. Standardisation is a proven concept to create order out of chaos by bringing parties together and establishing consensus-based agreements. As transitions are chaotic by default, standardisation is needed to make the energy transition happen, and to accelerate it.

Standardisation, certification, legislation, energy transition

I. INTRODUCTION

Standardisation is the process of developing a standard. A standard is a voluntary agreement on a product, system or service, aiming at taking away barriers (e.g. in trade or compatibility). Standardisation is characterised by three key principles:

- openness: all parties concerned have the possibility to participate (to develop broadly supported agreements)
- consensus: the ultimate agreement is acceptable for all stakeholders;
- transparency: agreements are publicly available for commenting and subsequently use.

This paper describes how standardisation supports the transition towards a low carbon energy system that is safe, reliable and affordable, taking into account the Dutch Energy agenda and EU policy related to the European Energy Union.

II. THE GOLDEN TRIANGLE

Fig. 1 shows the relationship between legislation, standardisation and certification, the concept also known as the 'golden triangle'. Standards can be used to demonstrate compliance with legal requirements. As standards are designed for voluntary use in principle, an organisation may still use other means to demonstrate to comply with the legal requirements (if reference is made to a standard), but often implementing the standard is the most efficient way.

An organisation can decide to become certified to particular standards, or is required to do so by its customer. Assessing conformity to a standard by a certification body increases the credibility of the organisation's claim to comply with a standard, and in this way with the relevant legal requirements.

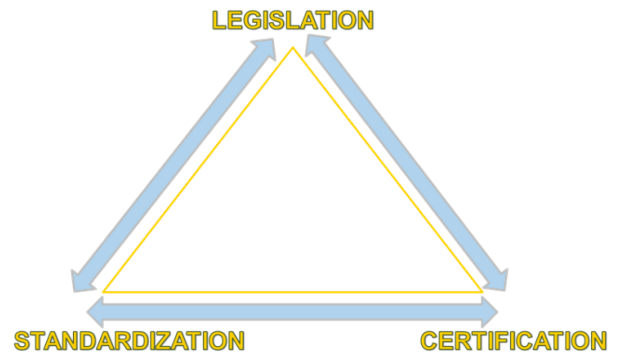


Fig. 1. The 'golden triangle'

The regulator can make use of certification during its supervision by accepting the certificate as proof of meeting legal requirements and/or focussing only on those aspects that are not covered by the certification.

Standardisation can also be deployed as a self-regulatory instrument in which the market sets the standard that may substitute (new) legal requirements if authorities acknowledge the broad support and implementation of these standards while meeting governmental objectives.

Several studies worldwide have provided insight into the economic and social benefits of standards for trade, national economies, industry sectors, individual companies and citizens [1]. In the field of energy, an international survey by AFNOR amongst ISO 50001-certified organisations demonstrated the added value of implementing an energy management system according to this international standard, both financially and non-financially (e.g. prioritising strategic actions, ramping up personnel's skills, comparing energy performance, trigger of innovation in industrial processes, products and services) [2].

III. TRENDS IN ENERGY TRANSITION

The pace of the energy transition including the composition of the future energy mix and the integration with other systems is difficult to predict. Various political, economic, social and technological factors may have impact on this transition. However, the sense of urgency to make the energy transition happen is present in view of climate change and security of energy supply.

A number of trends can be observed that would require new agreements that may be established via standardisation [3]:

- focus on steering on CO₂ reduction (i.e. energy saving, improving energy efficiency, use of renewable energy sources, carbon capture and utilisation / storage);
- further diversification of energy mix (e.g. more energy sources and carriers, need for storage and balancing);
- increased societal participation (e.g. supporters vs opponents of local energy projects, establishment of cooperatives);
- integration with other systems/developments (e.g. ICT, circular economy, biobased economy, smart cities).

IV. NEW AGREEMENTS TO ACCELERATE ENERGY TRANSITION

Standardisation has demonstrated its added value for decades, also in the field of safe, reliable and affordable energy systems [4]. Likewise, standardisation would be needed to make the energy transition happen and can even accelerate this transition by establishing new agreements for the extra steps that are needed. These steps include, but are not limited to [3]:

- enhanced deployment of interoperability between energy systems (e.g. ‘communication’ between different energy systems, also for balancing purposes);
- accelerating (application of) innovations (e.g. establishing state-of-art upon which parties can continue to build and introduce concepts sooner to the market);
- securing embedment (e.g. new systems should be fitted in existing systems including above- and belowground infrastructure);
- fostering social innovation (e.g. participation of local communities);
- increasing verifiability and transparency (e.g. unambiguous calculation, measurement and test methods, also suitable for benchmarking);
- enhanced deployment of system integration (e.g. linking to other developments as circular economy, internet of things, big data, smart cities and smart industries).

Berenschot [5] also concluded that the absence of (technical) standards and standardisation creates a barrier to scale up innovations. On the basis of standards, innovations may be certified or not. Certification is necessary to make innovations financeable and therefore applicable and fit-for-purpose into the current system. Obsolete standards can hamper certification. They also observed that in several cases not having standardisation and certification is perceived as an obstacle, which is perhaps one of the most underrated issues in the energy innovation. A successful deployment of the innovation and its implementation on a large scale often require standardised and certified products as well as maintenance protocols and other supporting documents.

V. STANDARDISATION AGENDA

Considering the trends and the extra steps that will be needed in the energy transition, NEN identified eleven themes in which standardisation and certification should be addressed to make the energy transition successful:

- safety and reliability of energy techniques, infrastructure and systems;
- interoperability within and between energy systems;
- balancing energy demand and supply;
- measurability and transparency of energy savings;
- comparability of CO₂ emission savings;
- management of social environment / stakeholders participation
- competency building of energy engineers, mechanics, installers, fitters, auditors and other experts
- acceleration of innovation by using standardisation in dissemination and market introduction;
- system integration by bringing together the forums tackling specific aspects, also beyond the energy sector, and creating coherence;
- education, already starting at secondary school;
- knowledge export via participation in worldwide standardisation, also opening new markets and business opportunities as well as knowledge building.

VI. VALIDATION AND ELABORATION

NEN is validating the standardisation agenda by inviting interested parties to respond to the identified themes, to open dialogues about potential gaps and further needs, and to translate the themes into more concrete projects that offer practical solutions to support the energy transition [6]. The goal is to elaborate and subsequently execute the standardisation agenda in cooperation with all stakeholders that play a role in the energy transition. In that respect, the validation process is also aiming at raising awareness of the role of standardisation in the energy transition and its relationship with legislation and certification.

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