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Standardization and the liberalization of the energy market

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Standardization and the liberalization of the energy market

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CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
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Foreword

By decision of the CENELEC Technical Board the recommendations made by CLC/BTWG 110-1 on the liberalization of the energy market were given the status of a Technical Report on 2002-09-24.

As these recommendations were to be considered of interest for CENELEC and IEC as well, a similar report was presented to the IEC/SMB meeting end of October 2002.

Contents

Executive summary

Liberalization of the energy market is an ongoing process, changing old interfaces between the various parties and creating new entities and hence new interfaces. In view of the increasing complexity in the various relationships standardization has the potential to facilitate and rationalize the interfaces.

This report aims to define the existing major interactions and to identify aspects suitable for standardization in the near future.

It is anticipated that the liberalization process will continue to develop and therefore it is recommended to establish a structure within IEC which will follow the ongoing process and take the necessary initiatives to create and maintain a system approach covering the whole market from production at various levels down to the utilization at the costumer level.

Although a major part of the standards are in place, some new fields need to be considered. It is also felt necessary by the working group to improve the co-ordination between the committees involved and ensure that all necessary system aspects are covered. In addition to the recommendations to review or complement the present portfolio of standards a key recommendation is to convert the present TC 8 into a system committee for electric energy supply system.

It is also recommended that CENELEC should set up a mirror committee to IEC/TC 8 to follow and complement the IEC work in areas where there is a particular European need. Two of these areas are identified in the report.

1 Background

1.1 Situation in Europe

In recent years, the electrical energy sector has seen substantial changes, especially in Europe due to several legislative and policy initiatives from EU, such as the Directive "*concerning common rules for the internal market in electricity*", published in 1996. Furthermore, other regions of the world are facing similar changes, in order to attract foreign investors or to create competition in their national markets.

As a result of this evolving situation, changes in the business definition, new operators and consequently, new interfaces have arisen.

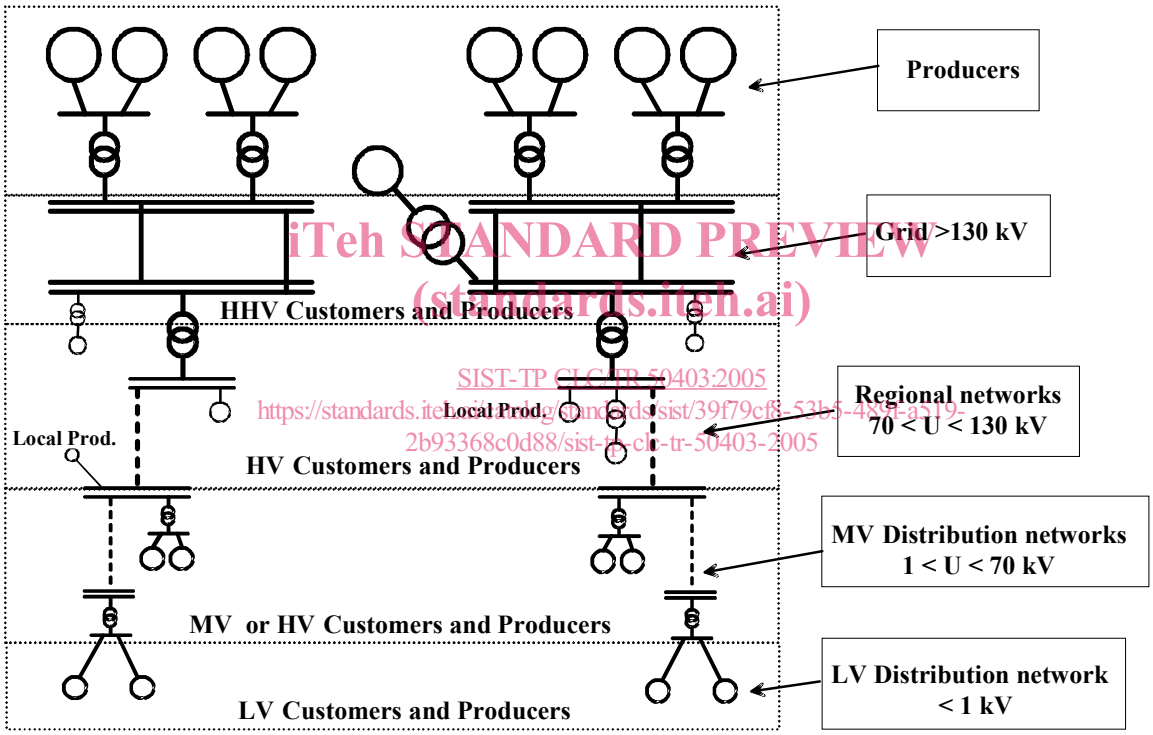

Figure 1 – Increasing complexity and relations between actors in the electricity supply

Grid and network operators (transmission and distribution) provide services as monopolies, under the responsibility of regulators appointed by authorities. In the liberalized market generation and supply of electric energy will operate in an open market. In this market, rules for access to network in order to provide proper operation of the electrical system and equitable treatment for all parties are of high priority. In addition, taking into account the increasing competition amongst electrical companies, new ways to address customers and new services are offered. The increasing possibility for consumers to choose from different electricity suppliers, raises practical questions such as energy-metering and transparency of billing.

In this changing environment, it is necessary to evaluate how standardization can facilitate and rationalize these new interfaces.

Following the Stockholm EU Summit, the liberalization of the electricity market has become a highly important political issue, which has been reinforced by the EU Presidency Conclusions, after the 2002 spring EU Council in Barcelona (see Annex A).

This gives a strategic opportunity for the European electrical energy industry, and also for CENELEC, as a standardization services provider, to take the lead in contributing to the liberalization process, in close cooperation with the IEC.

In order to guarantee the effectiveness of the European liberalized system, corresponding to market and regulatory needs, it is necessary to take into account the different experiences obtained from the present systems in the different countries.

However, a common approach, stemming from identification of trends, opportunities and state-of-the-art of the existing standards, leading to harmonized conditions, would clearly benefit European society in general, the industrial community and consumers.

1.2 North America – yesterday and today

The North American Transmission Grid has been, and continues to be, owned and operated by a number of different public and private companies in various jurisdictions across the United States and Canada. In the past, all players were vertically integrated and grid reliability was assured through the voluntary participation of all members in a standard-setting process. However, the continuing restructuring process within the industry has raised concerns about its ability to maintain reliability while also addressing the needs for business standards. The transmission grid is the ‘highway’ by which means electricity can be bought and sold. As more and more markets open to competition, the need for reliable and fair access to the transmission grid becomes less clear to govern resulting in imminent implementation of mandatory reliability standards.

In Canada regulation of the electricity industry is primarily in the hands of provincial governments. The federal regulator (National Energy Board) is responsible for regulating the import and export of power, but all other regulatory matters are under provincial jurisdiction.

For more details, see Annex B.

2 Identification of interactions and aspects suitable for standardization in different areas

The table presented below summarizes aspects which may be suitable for standardization. The headings in the table are expanded below.

Terminology

The terminology can be expected to emerge as the standards develop but it is envisaged that there will be a need to identify the various participants in the electricity market, the interfaces between participants and certain aspects of technical detail, for which there are specific meanings in the particular context of the electricity market.

Quality of supply

Some aspects of quality of supply are covered in the existing standard EN 50160 and there is a relationship between this standard and EMC standards related to conducted disturbances. It might be possible to provide more detail for some parts of EN 50160 and to specify performance indicators covering areas of interest to regulators and consumers.

Security of supply

Under this heading it is possible to consider a wide range of aspects:

- The basic connectivity of the networks, in terms of ability to continue to deliver electricity following faults or planned outages.
- The ability to match the consumer's demand, with the available generating capacity, both instantaneously and in terms of longer term changes in electricity usage.
- The operation of networks, especially at the highest voltage levels, in a manner which maintains a stable set of conditions.
- The possibility of maintaining electricity supply in discrete areas, "islands", following disruption to interconnected transmission grids and the ability to restore and maintain supplies within these discrete areas in such cases.

Connection practices

Clarification and standardisation of the basic requirements for connection will support networks to be planned, designed and constructed to operate economically, securely and safely and to facilitate the use of the networks by all the interested economic interests.

These connection practices will support the:

- Establishment of technical conditions which facilitate the interfacing of systems at points of entry to and exit from the networks;
- Formalization of the exchange of system planning data; and provide sufficient information for a user to assess opportunities for connection and to plan and develop his system so as to be compatible with the network.

Measurement

Included in this aspect are the requirements for data exchange protocols and minimum requirements for billing information provided by electricity suppliers to consumers or between the involved operators.

Communication

Communication needs between various economic operators arise in terms of:

- The day-to-day operation of the networks, generators and consumer loads, for example for generator scheduling or switching in networks.
- The essential communication between the various parties to avoid dangerous conditions or in the event of potentially dangerous incidents.

Network responsibility

Within this context it is possible to envisage addressing best practice in the operation and maintenance of networks and the necessary elements of operational safety management systems.

Regarding Environmental Safety,
consideration in this context could be given to best practice in respect of:

- spillages of oil and leakage of gas insulation,
- ground excavation for cables and re-instatement,
- public activities near overhead lines,
- security of substations.

Charging mechanisms for use of public networks

Best practice might usefully be codified in terms of:

- the aspects of network design, hardware and operation to be considered in the charging mechanisms,
- methodologies for recovery of costs,
- openness and clarity of billing processes.

Maintenance

Maintenance in various forms constitutes an essential part of the delivery of electricity and a substantial part of the costs of operating a network. There might be benefits in establishing best practice in terms, for example, of:

- frequency and specification of maintenance procedures,
- assessment of public safety in relation to overhead assets.