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CIGRE TECHNICAL COMMITTEE STRATEGIC PLAN 2008 - 2018

MISSION STATEMENT

The CIGRE Technical Committee is a worldwide platform for the elaboration and exchange of knowledge and information on all aspects of the electrical power sector.

Through the participation of experts from all regions of the world, the Technical Committee provides a global perspective on the issues and challenges facing the electrical power sector.

The Technical Committee delivers value by ensuring that the technical work of CIGRE is focused on the identified issues and that the resulting knowledge and information is competently disseminated on a worldwide basis.

The Technical Committee also has an important role in shaping the future of the electrical power sector and maintaining the associated knowledge and expertise.

1. INTRODUCTION

The vision of CIGRE as established in its Masterplan is that 'CIGRE shall be recognized as the leading worldwide organization on electrical power systems, covering their technical, economic and environmental aspects and taking account of the impact of organizational and regulatory dimensions'.

The role of the Technical Committee is to contribute to the fulfilment of CIGRE's vision through the work of its Study Committees.

There are now more changes, challenges and pressures facing the electrical power sector than have been experienced for many years.

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The main factors that will shape the future of the electrical power sector can be represented by Figure 1, which comprises five elements, as follows:

1. **Customer energy demands**
2. **Environmental challenges**
3. **Regulation, legislation and targets**
4. **New and developing technologies**
5. **System development and operation**

CIGRE is in a prime position to provide information and knowledge to decision makers regarding all these areas.

This Strategic Plan sets out the strategic technical directions to be followed by the Technical Committee over the period 2008 – 2018 in order to address the above factors.

In addition the Plan outlines the organisational strategy of the Technical Committee.

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The Plan is structured in three parts, as follows:

- **the factors shaping the future electrical power sector**
- **the strategic directions of the Technical Committee**
- **the organisational strategy of the Technical Committee**

2. FACTORS SHAPING THE FUTURE ELECTRICAL POWER SECTOR

CUSTOMER ENERGY DEMANDS

- **Variable growth rates, from very high levels in developing countries to more modest levels for established electrical power systems**
- **Increasing role of electricity in the total energy sector**
- **Greater focus on quality of supply**
- **Difficulties conveying power into major load centres**
- **Impact of urbanisation and mega-cities**
- **Greater use of electric transportation in both the public and private sectors**
- **Growing requirements for access to electricity supply**
- **Impact of fuel availability and price**
- **Changes to historic seasonal load patterns e.g. summer demand peaks due to growth of air conditioning**

ENVIRONMENTAL CHALLENGES

- **Intensified environmental pressures due to climate change concerns (CO2 emission levels, increasing frequency and severity of extreme weather conditions, water availability etc)**
- **Growing concern about the environmental impact of the electrical power system and reduced public acceptability of the associated infrastructure**
- **Increasing requirements for the electrical power sector to play its role in promoting sustainable development**
- **Increasing drive towards accepting greater amounts of intermittent energy from renewable sources**
- **Increasing focus on whole lifecycle investment decisions (design to decommissioning)**

REGULATION, LEGISLATION AND TARGETS

- **Government fuel policies (renewable energy, nuclear, clean coal, carbon capture, reduction in energy consumption etc) set targets for fuel mix and greater national fuel security.**
- **International and national standards for EMF levels, CO2 emission targets, carbon trading, and health and safety.**
- **Growth of international interconnections *vs* national supply security considerations.**
- **Increasing involvement of energy users in decisions about the future energy sources and the shape of the electrical power system.**

NEW AND DEVELOPING TECHNOLOGIES

- **Introduction and performance of new energy generation technologies may change the structure of the electrical power system**
- **Increasing pressure not to increase the environmental impact of the existing network and to use the electrical power system more efficiently will drive technological developments at all voltages.**
- **Need for energy storage devices and their integration into the electrical power system in connection with an increasing amount of intermittent generation.**
- **Demand management through the use of "intelligent networks" will be required to cope with an increasing proportion of intermittent generation.**
- **The integration of demand management into system and market operations will require additional novel control devices.**
- **The performance of new materials may significantly affect the system**

- **Enhanced monitoring and diagnostic techniques will reduce the failure risk and may improve the lifetime**
- **Need for new automatic, protection and control systems to manage power flow, improve utilization of assets, minimise power interruptions, increase network availability and security.**
- **Improved system security is required against both conventional and cyber type threats.**
- **New practices and technology are required to minimise the occurrence and extent of large incidents**

SYSTEM DEVELOPMENT AND OPERATION

- **Countries with an established electrical power system are now facing the need to replace assets and to operate the system differently. There is an increasing importance of asset management techniques to improve efficiency and reduce cost**
- **Countries developing new electrical power systems striving to bring electricity to the entire population**
- **Governments setting new rules based upon perceived needs : the electrical power sector must meet these new rules and targets whilst also maintaining a reliable energy supply.**
- **There is an increasing trend towards outsourcing of R&D, maintenance, construction, etc.**
- **Distribution is fast becoming an active network and end users participate in system balancing. Future plans must therefore focus on entire networks (generation, transmission, distribution, end use)**
- **New generation sources may have a significant impact on the network**
- **Grid Codes and security standards may need to be changed to reflect the change of generation sources**
- **There is an increasing need for bulk power transmission over long distances**
- **Regulatory frameworks continue to evolve to facilitate introduction of new generation in the energy market and this may impact the development and operation of electrical networks**

3. STRATEGIC DIRECTIONS OF THE TECHNICAL COMMITTEE

Taking into consideration the factors outlined above (in Chapter 2), the Technical Committee derives its major strategic directions as illustrated in Figure 1 and presented below :

STRATEGIC DIRECTION 1 : CUSTOMER ENERGY DEMANDS

- **Examine on an ongoing basis the evolution of demand scenarios**
- **Analyse solutions for maintaining security of supply**
- **Investigate demand side management approaches**
- **Examine the challenges facing developing countries and explore ways to facilitate access to electricity.**

STRATEGIC DIRECTION 2 : ENVIRONMENTAL CHALLENGES

- **Envisage solutions to address the environmental concerns faced by the electrical power sector**
- **Envisage solutions to address the public acceptability issues faced by the electrical power sector**
- **Record the lessons learnt and solutions adopted worldwide**
- **Study system efficiency solutions**

STRATEGIC DIRECTION 3 : REGULATION, LEGISLATION AND TARGETS

- **Study and analyse the consequences of regulatory changes for the electrical power sector**
- **Record the solutions adopted and the experience gained worldwide**
- **Provide unbiased technical information to assist decision makers and stakeholders**

STRATEGIC DIRECTION 4 : NEW AND DEVELOPING TECHNOLOGIES

- **Identify and support new and developing technological solutions and highlight their potential contribution to the electrical power system**
- **Facilitate the adoption of new technological solutions by providing suitable CIGRE technical recommendations and supporting the subsequent standardisation process.**
- **Elaborate and provide knowledge on new technology in selected areas and act as a repository for the associated information.**

STRATEGIC DIRECTION 5 : SYSTEM DEVELOPMENT AND OPERATION

- **Study the transmission and distribution system as a whole**
- **Analyse the system implications of new generation technologies.**
- **Identify methods to improve the efficient utilization of existing assets.**
- **Identify methods to maintain the supply reliability under the changes taking place.**
- **Analyse the implications of new technologies and how these can be most efficiently applied.**
- **Provide a vision of the future electrical power system.**

4. ORGANISATIONAL STRATEGY OF THE TECHNICAL COMMITTEE

- **Establish stronger ties with the CIGRE National Committees.**
- **Establish closer links with other appropriate organisations.**
- **Increase the involvement of the younger members of CIGRE in SC and WG activities**
- **Review the publication policy for ELECTRA to increase its visibility and include a scientific section.**
- **Increase the dissemination of knowledge by means of tutorials.**
- **Improve response time, particularly in case of urgent issues.**
- **Improve the quality of published documents and focus on the target audience**
- **Create TC projects to handle widely inter disciplinary subjects.**
- **Improve the selection process for SC members (including the chairmen) to include better succession planning**
- **Highlight the importance of electricity in society and underline the need for scientists and engineers with an electrical power education background.**
- **Support actions aimed at preventing the loss of expertise and knowledge in the electric power sector.**

5.CONCLUDING REMARKS

- **This Strategic Plan covers the period 2008 – 2018 but may be revised during that period if required.**
- **This Strategic Plan will be made available on the CIGRE website and published in Electra.**
- **An Action Plan will be developed in the autumn of 2008.**

Fig 1: CIGRE STRATEGIC TECHNICAL DIRECTIONS