

SOUTH EASTERN EUROPEAN REGION OF CIGRÉ

SEERC

AUT - BIH - GRC - HRV - HUN - ITA - MKD - MNE - ROU - SRB - SVN - TUR - UKR - CZE&SVK

Preliminary Questionnaire results



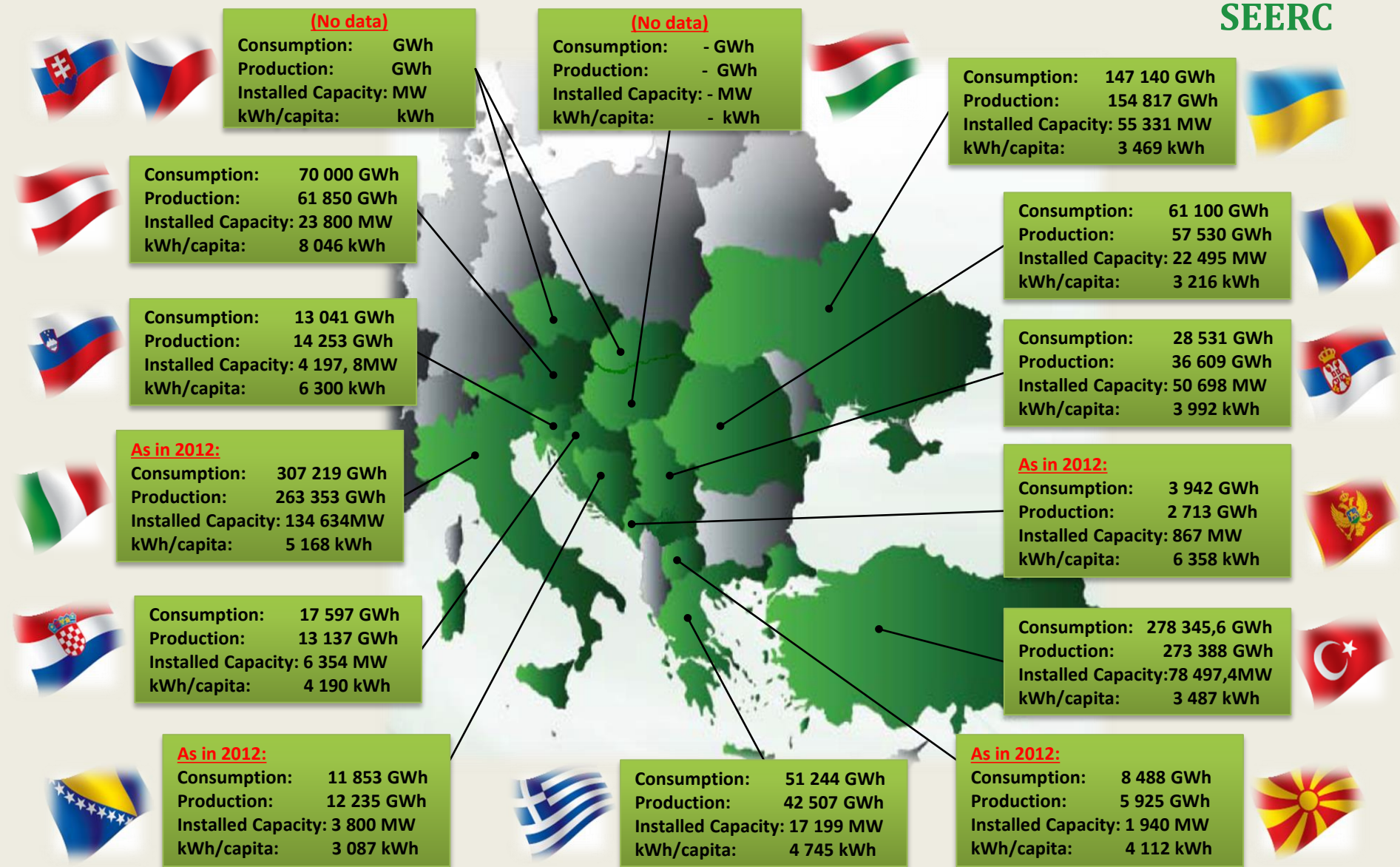
3rd Technical Advisory Committee meeting
Prague, 15. 03. 2017.

**The list of SEERC countries
that didn't submit
Questionnaires**

- Montenegro;
- Macedonia;
- Italy;
- Hungary;
- Czech Republic and Slovakia;
- Bosnia and Herzegovina;

Data for 2015 year:

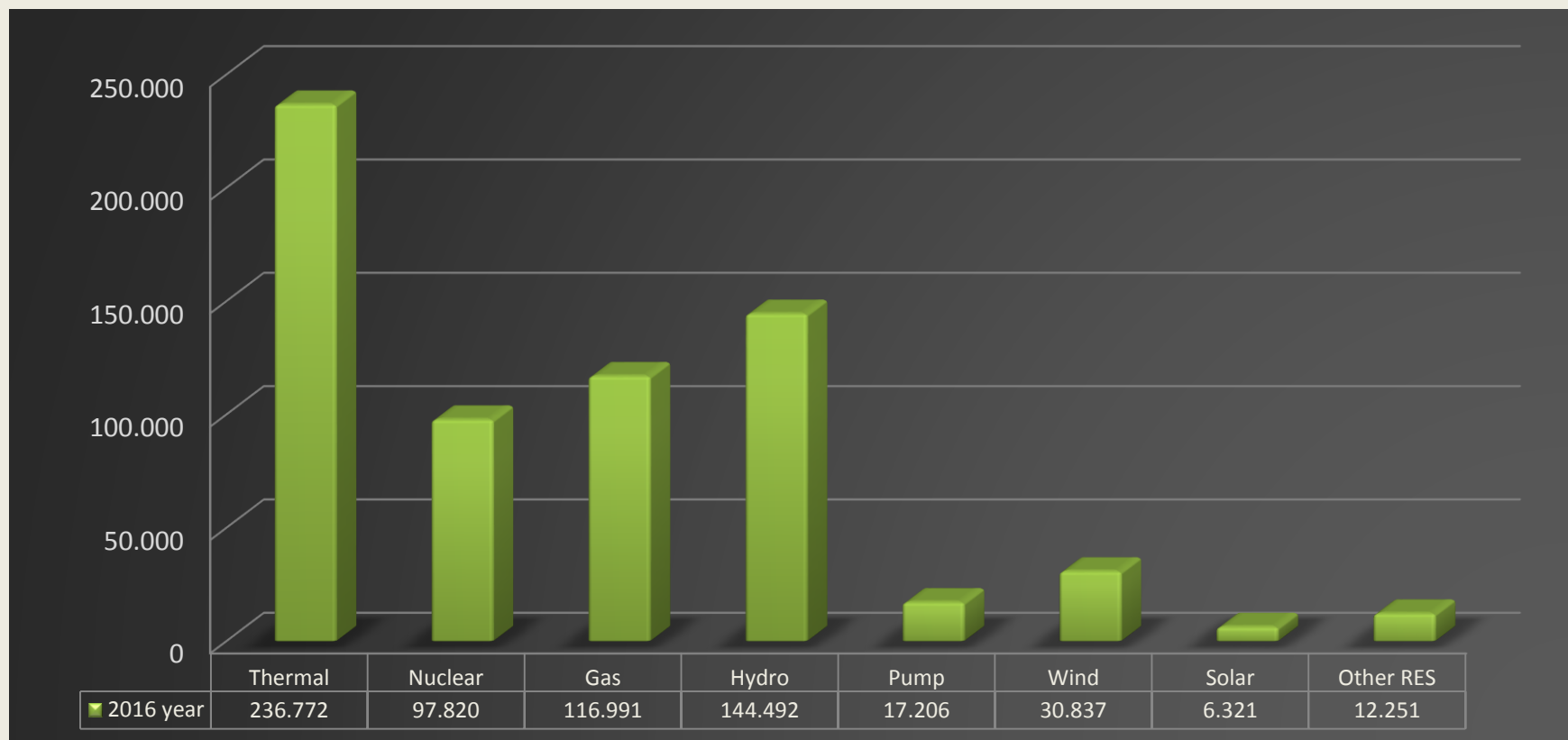
- Serbia;
- Slovenia;



Outline

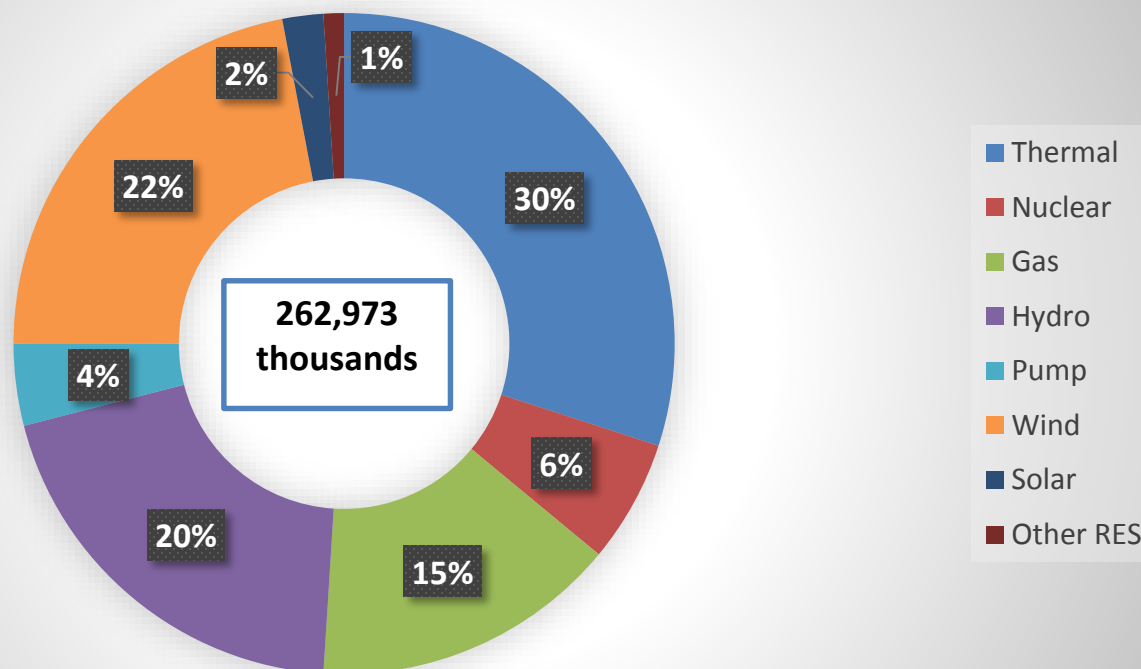
- **Energy Situation in SEERC Member Countries (Energy Outlook);**
- **Regional Academic and Industry Outlook;**
- **Interests in Leadership of topics;**
- **Technical Fields of Interest for Regional CIGRE Cooperation;**
- **Outlook of electrical equipment produced in each country;**
- **Outlook of events in SEERC Region**

Total Generated Energy in SEERC Member Countries, [GWh]



Installed Capacity in SEERC Member Countries [MW]

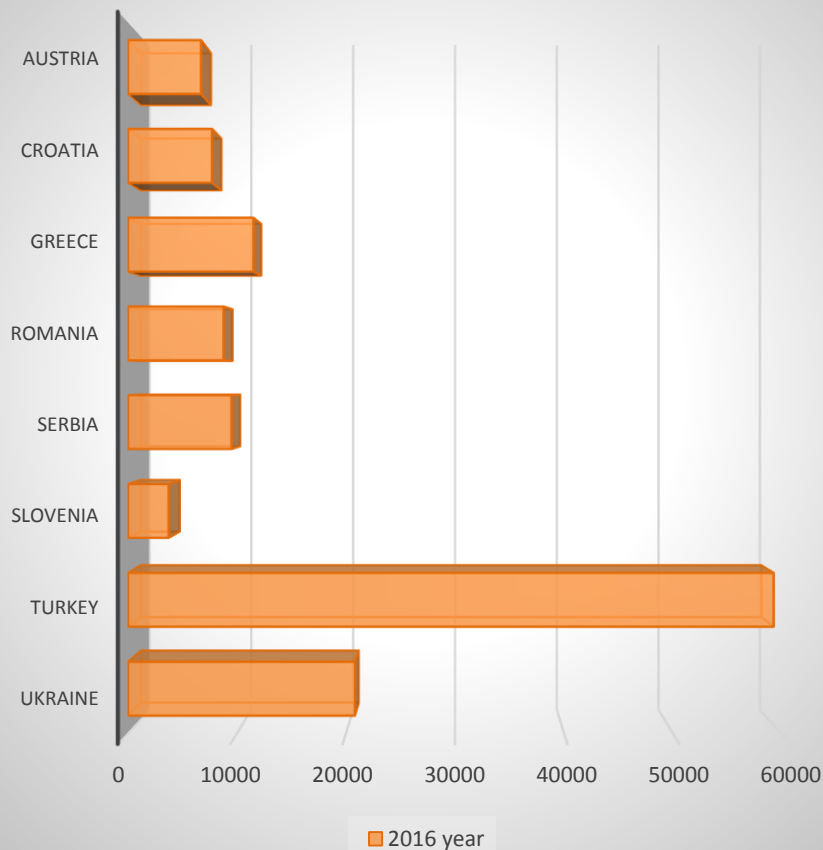
2016 year



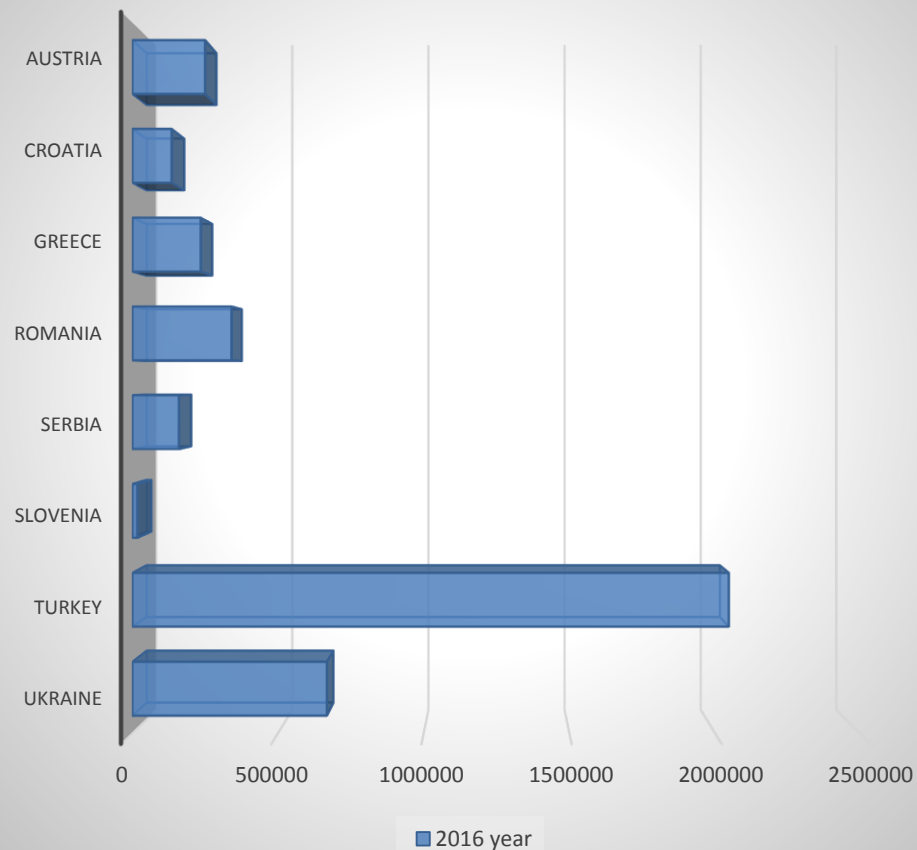
Transmission and Distribution Line Length Out

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Transmission Line Length [km]



Distribution Line Length [km]

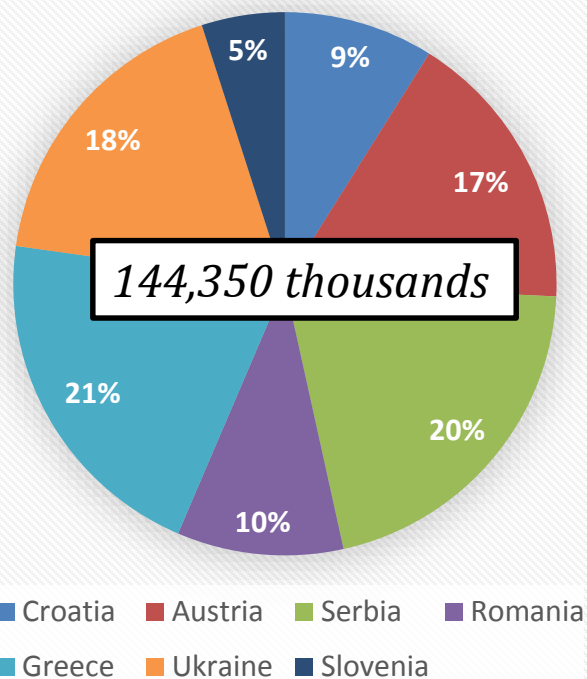


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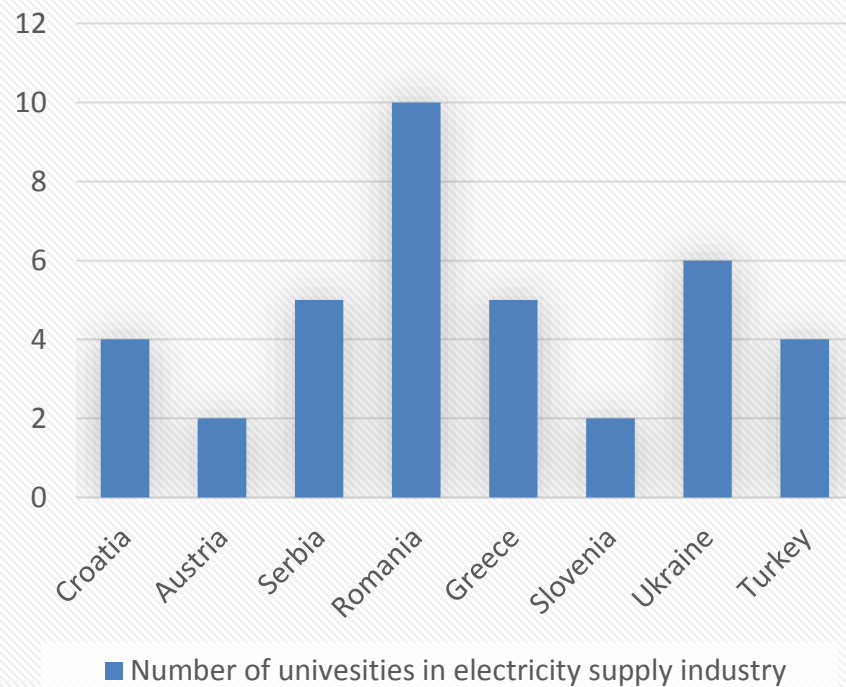
Regional Electric Industry and Academy

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Average number of employees in electricity supply industry



Number of universities in electricity supply industry



2016 year



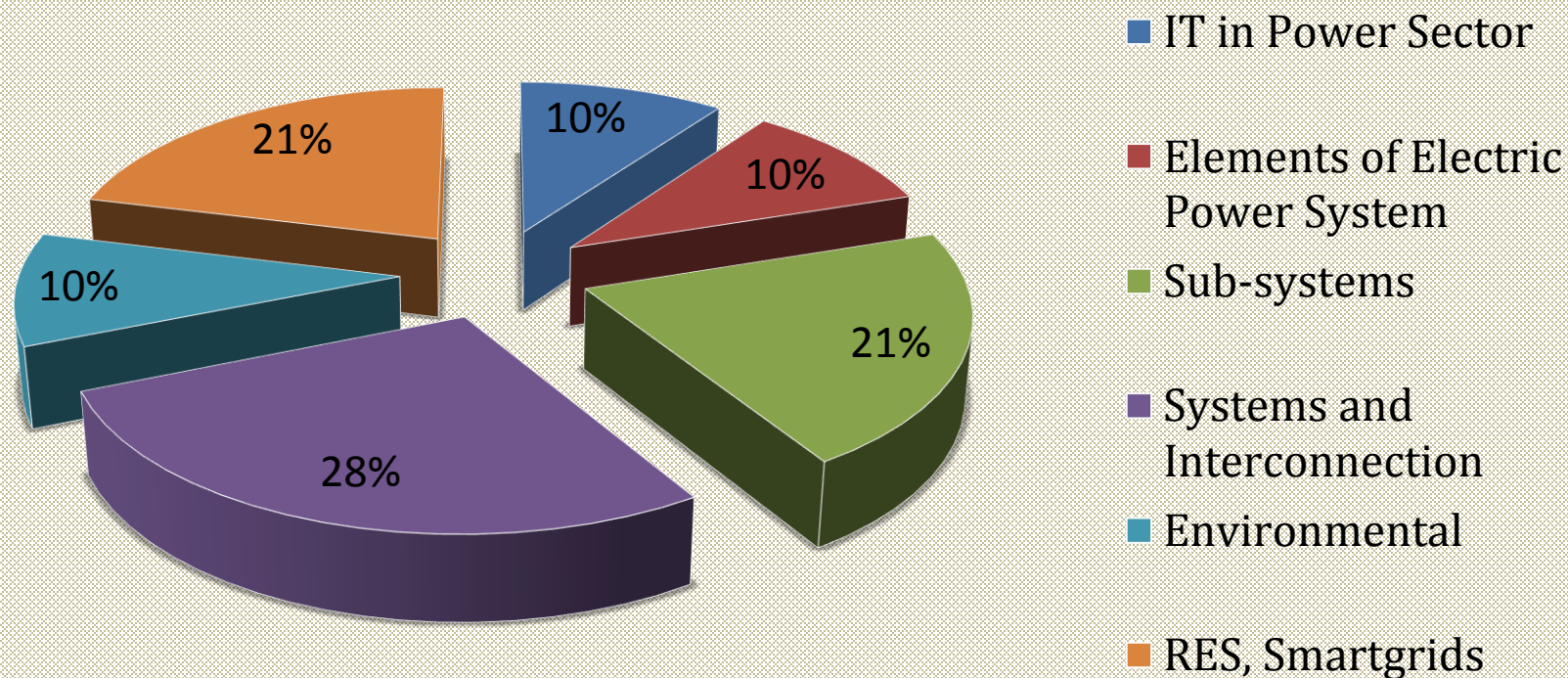
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Technical Fields of Interest for Regional CIGRE Cooperation

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2016 year

Preferences of SEERC Region



Preferred CIGRE's SC – leadership interest

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Study Committees CIGRE	AUT	GRC	HRV	ROU	SRB	SVN	TUR	UKR
A1 (Rotating Electrical Machines)			✓					
A2 (Transformers)			✓					✓
A3 (High Voltage Equipment)						✓		
B1 (Insulated Cables)								
B2 (Overhead Lines)	✓							
B3 (Substations)								
B4 (HVDC and Power Electronics)		✓						
B5 (Protection and Automation)			✓					v
C1 (System Development and Economics)		✓	✓			✓		
C2 (System Operation and Control)								
C3 (System Environmental Performance)	✓							
C4 (System Technical Performance)		✓						
C5 (Electricity Markets and Regulation)			✓					
C6 (Distribution Systems and Dispersed Generation)		✓				✓		
D1 (Materials and Emerging Test Techniques)								
D2 (Information Systems and Telecommunication)								



3rd Technical Advisory Committee meeting
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- ☐ Regional cooperation in certain standards uprating;
- ☐ Regional initiatives for innovation in Power sector;
- ☐ Large regional projects issues (covering more CIGRE SCs)

Fields of Interest

Power Systems Development, Innovations and Standards

Renewable Energy Sources and Energy Accumulation

Market Design and Operation

Environmental and cooperation between National
Committees issues

Power Systems Development, Innovations and Standards

- Smart Grid in Transmission or/and Distribution;
- Future of Thermal Power plants;
- On Shore Interconnection;
- Upgrading of existing Lines;
- Long Distance HVAC Cables (i.e. Malta-Italy);
- Conversion from Overhead to Underground Transmission;
- Superconductors;
- Conversion AC Lines to DC Lines (even Hybrid Lines);
- HVDC transmission (Overhead, Underground and Submarine);

Power Systems Development, Innovations and Standards

- Construction of strategic OHLs: Environmental impact (EIA) including EMF, corona noise, etc., property issues (way leave matters), permissions, corridors, forest, C&B analyses (difficulties in justification of cross border projects, market impact, other impact (CBT, NTC, TTC... which might have some impact), “bankability” impact (social impact, etc.);
- Regional center (concentrator) WAMS (otherwise, majority is too small for “national”...);

Power Systems Development, Innovations and Standards

- Minimal (optimal) requests for protection of cross-border OHLs (Main_1, Main_2, backup, signal transfer (OPGW, HF...), logic for signaling, line differential (when?), Telecommunication paths (redundancy), remaining signals (BB protection, BF protection...), remaining protection and automatizations (power swing, out of step, overload, additional directional earthfault, ...), telecomm links for data interchange (SCADA, WAMS, fault location, events...);

Power Systems Development, Innovations and Standards

- Power quality, TSO role in obtaining goals related to power quality (requirements, means and procedures, coordination, propagation, formal requests TSO vs clients, monitoring, logging, sanctions, penalties);
- System development;
- Interconnections Technical Issues
- Smart Grid in Distribution
- Maintenance Technologies and practices in the regional TSOs and DSOs infrastructures;
- Partial Discharge Measurement Techniques under HVDC

Renewable Energy Sources and Energy Accumulation

- Influence of Large Installation of Renewables on Power System;
- Experience, politics ... for connections of large renewables (procedures, requirements of TSO, grid code requirements, commissioning, performance test (trial operation), measurements, power quality, etc;
- Impact of big RES on power system;

Renewable Energy Sources and Energy Accumulation

- Impact of RES on the network development, operation and market;
- Potentials in different countries in region by RESs;
- Open discussion on European Energy Union issues;
- Renewable energy sources (RES) such as: mini HPP, micro HPP, solar PV, solar thermal energy, biomass, wind energy;
- Power system support mechanism;
- Market structure and integration experience for RES, integration of electromobiles/hybrids , energy accumulation

Market Design and Operation

- Market Design & Experiences with Renewable Integration;
- Issues related to regional markets (or funding regional markets);
- Market development design;
- Smart Grid (IARAD);
- Interconnections Market Issues;
- Asset Management;

Environmental and cooperation between National Committees issues

- Improving cooperation between National Committees (especially neighbors), popularization of CIGRE association, inclusion of young engineers (students), interchange of proceedings from national conferences and symposiums (CDs), regional web site, etc.;
- Environmental issues

Outlook of electrical equipment produced in each country

Croatia

- ✓ Generators;
- ✓ Transformers;
- ✓ Motors;
- ✓ Wind Power Plants;
- ✓ Metering;
- ✓ Switchgear (MV and HV);
- ✓ Information technology;
- ✓ Telecommunications technology;
- ✓ Cables up to 110 kV



Austria

- ✓ Transformers;
- ✓ OHL (towers, insulation, fittings, conductors,...);
- ✓ Cables (up to medium voltage);
- ✓ Sensory Systems;
- ✓ Protection Systems;
- ✓ Planning Consultants



Outlook of electrical equipment produced in each country

Serbia

- ✓ • Engineering design and consultancy services related to projects in the fields of energy
- ✓ • pipe systems of energetic boilers, steam lines & pipelines, solid fuels burning systems, coal mills, power fans, coal and ash transport systems
- ✓ • hydro mechanical equipment
- ✓ • SCADA software, ATLAS remote telemetry stations, PLC units, ARES electrical energy registration devices, measurement equipment
- ✓ • LV asynchronous motors, HV asynchronous motors, synchronous and asynchronous hydro / wind generators
- ✓ • electrostatic precipitators
- ✓ • composite polymer insulators, surge arresters, outdoor line disconnectors and fuse-bases, to complete transformer substations, and other equipment (ELBI)
- ✓ • LV and MV cables and conductors



Romania

- ✓ HV cables;
- ✓ HV conductors;
- ✓ HV insulators;
- ✓ HV circuit breakers and disconnectors;
- ✓ HV power transformers;
- ✓ HV OHL pillars/towers



Outlook of electrical equipment produced in each country

SEERC

Greece	Ukraine	Slovenia
✓ Transformers; ✓ Cables; ✓ Poles; ✓ Metering Industry; ✓ Switchgear manufacturing MV and LV equipment; ✓ Construction, Installation, Maintenance, Repair in large scale T & D projects; ✓ Consultancy Services in Engineering and Inspection 	✓ Generators; ✓ Transformers; ✓ Switchgears; ✓ Insulators; ✓ Cables, ✓ MV and LV equipment ✓ HV OHL pillars/towers, ✓ 10-35kV circuit breakers ✓ Consultancy Services in Engineering and Inspection 	✓ Power Transformers ✓ Metering industry ✓ Switchgear manufacturer. MV and LV equipment ✓ Information technology 

Outlook of electrical equipment produced in each country

Turkey

- ✓ Dry Type, Special Type, Distribution and Power Transformers up to 1000 MVA or 750 kV;
- ✓ Low, Medium and High Voltage Cables up to 380 kV;
- ✓ Silicone and Composite Insulators up to 520 kV
- ✓ Medium and High Voltage Disconnectors and Circuit Breakers;
- ✓ Switchgear Systems and Modular Assembly up to 52 kV;
- ✓ Insulation Material for Transformers (Laminated Pressboard, Pressboard etc);
- ✓ Instrument Transformers from 10 kV to 380 kV;
- ✓ Coupling Capacitors for Power Network;
- ✓ Hardware Fittings for High Power Transmission Lines and Power Plants From 36 kV up to 525 kV;
- ✓ Reference High Voltage Measuring Systems AC, DC, LI and SI.



Outlook of electrical equipment produced in each country

Mainstream production of equipment in SEERC region



✓ Transformers;

✓ Cables;

✓ Metering equipment;

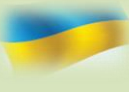
Outlook of the events in SEERC Region

SEERC

	Country	Event	Date
	Croatia	13thHRO CIGRE SESSION Šibenik/ Croatia,	November 5 – 8, 2017
		4th International Colloquium "Transformer Research and Asset Management" Pula / Croatia	May 10 -12, 2017
	Austria	SC-A1 Rotating Electrical Machines Meeting and Colloquium, Vienna,	September 2017
	Serbia	33rd Conference of NC CIGRE Serbia, Zlatibor	June 5– 8, 2017
		18th Symposia of NC CIGRE Serbia – Control and Communications in Power Systems	October 2018
	Romania	CMDM 2017 (4th edition), Bucharest;	September 25-27, 2017
		RSEERC 2018 (4th edition)	
	Turkey	High Voltage and Power System National Workshop	2018

Outlook of the events in SEERC Region

SEERC

	Country	Event	Date
	Greece	Athens 2017, CIGRE NC of Greece Session (2days conference)	December 2017
	Slovenia	International Colloquium on Lightning and Power Systems (by SC C4), Ljubljana	September 18-20, 2017
		13th Conference of Electric Power Engineering (CIGRE & CIRED sections), Maribor	May 22-24, 2017
		International CIRED Workshop, Ljubljana, (Microgrids and local energy communities)	June 13-14, 2018
		4th National Conference on Maintenance in the Electric Power System, N. Gorica,	November 15, 2018
		CIGRE SYMPOSIUM 2021, Slovenia	October 2021
	Ukraine	International Conference “Energoforum” (CIGRE NC, Ministry of Power), Kyiv	7-9 th of November 2017



Thank you