Electricity Restructuring in South East Europe - Examples from the Balkan Countries

A Seminar on Energy Transformations in Central and East Europe

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Contents

Introduction

- Assessment done on 8 power systems 8 countries (BiH, SLO, CRO,SER, MNG, MAC, BUL, RO)
- Most of the assessed power systems/TSOs were part of the common power system of former Yugoslavia (separation started in early 90's), except power system of Romania & Bulgaria
- Non-synchronous operation from main UCTE area during 1992-2004
- Strong operational interdependency with neighbouring power systems
- Region characterised by controversies: a lot of similarities but also significant differences

Historical Background (1)

- Similar political, economical and technical background of all assessed countries/TSOs:
  - all countries have socialist background with centrally planned economy and industry
  - all "former YU" countries operate infrastructure developed for a common power syst
  - generation dominated by Russian technologies
  - similar technical standards on power sector infrastructure
- Most of the area strongly affected by the war in the region during 90's
  - devastation of transmission infrastructure
  - irregularities in power system operating conditions
  - numerous interruptions of power supply and load shedding

Historical Background (2)

- Similar road-map of the restructuring process:

  - starting from vertically integrated utilities

  - stated-owned public monopolies

  - end consumer electricity prices not cost reflective, main reasons: social affordability and political sensitivity

  - limited market experience at the beginning of restructuring: resulting from the previous political and economic organisation in the countries

- Lack of strategic investments in generation infrastructure:

  - since 1990 no major new generation capacities (exception nuclear capacity in Romania)

  - some measures in refurbishment of generation capacities

Basic Data Overview (1)

2004		BiH	CRO	SLO	SER**	MNG	MAC	ROM	BUL
Population	/	4354911	4496000	1997590	9543157	650575	2030000	22400000	7780000
GDP	m€	6291	27670	25919	17295	1475	4327	59973	18954
GDP/capita	€	1642	6229	12977	1876	2267	2131	2686	2554
Inst. Capacity	MW	3941	3995	2785	8633	855.5	1451	16743	12130
Generation	GWh	12715	14995	11229	35414	3186	6213	51934	41538
Consumption	GWh	10761	15328	12067	35895	4317	7389	50746	35659
Balance *	GWh	1952	-1100	-838	-481	-1231	-1176	1522	6615
Trans. Losses	%	3.01	3.65	1.56	3.45	3.83	2.82	2.62	3.06
Distr. Losses	%	20.0	10.56	6.25	15.1***	23.1	14.1	14.22	13.02

* - "+" means "net export" and "-" means "net import"

** - including Kosovo

*** - value for Serbia only, due to extremely high losses in Kosovo (cca 46%)

Basic Data Overview (2)

2004	Installed capacity (GW)	Generation (TWh)	Consumption (TWh)	Peak load (GW)
Assessed countries	50.2	177.2	172.2	cca. 30.0
Germany	109	529	513	72
France	112	547	477	86
Italy	80	286	322	53.1
Spain	56	242	235	37.2

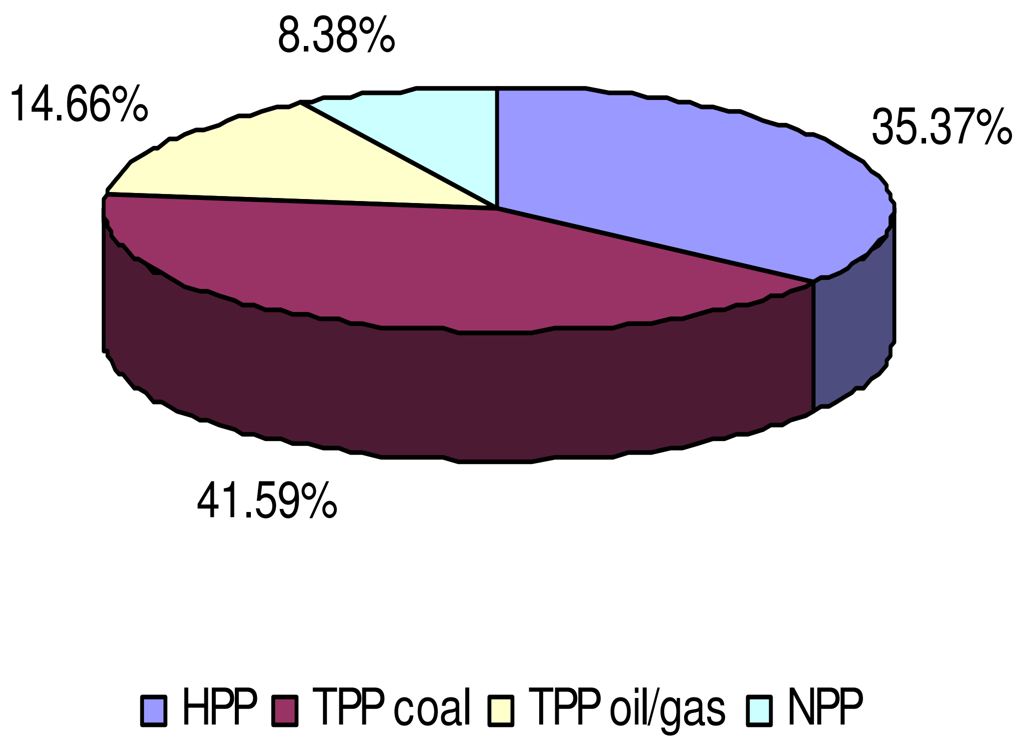
Basic Data Overview (3)

- Generation Capacity Structure 1 -

2004	Total	BiH	CRO	SLO	SER	MNG	MAC	ROM	BUL
Nuclear	**4205**	/	335	335	/	/	/	655	2880
Thermal coal	20878	1984	205	950	5404	210	745	5881	5499
Thermal oil/gas	7359	/	1373	312	353	/	198	4200	923
Thermal total	**28237**	1984	1578	1262	5757	210	943	10081	6422
Hydro	**17753**	1957	2079	862	2866	646	508	6007	2828
TOTAL	**50195**	3941	3992	2459	8623	856	1451	16743	12130

Basic Data Overview (4)

- Generation Capacity Structure for SEE region 2 -



Operational Aspects

- general -

- Quality of power system operation (in terms of system stability) increased after reconnection
- Strong operational interactions among all power systems (small geographic area)
- Common binding technical operational standards (UCTE OH) accepted in the area (except for Albania which is not a UCTE member) but not fully applied (lack of enforcement mechanism)

Operational Aspects

- power balance -

- Most of the countries import electricity (also Albania and Greece which are not presented)
- Countries which are annually energy balanced have difficulties with power balance (seasonal variations cause power deficit in winter and occasional surplus in summer – depending on hydrology)
- Low level of operational reserve
- Significant impact of hydrology on power balance
- Aged generation assets, low technical availability of thermal generation
- Significant seasonal load variations (due to consumption structure, mainly dominated by households)

Operational Aspects

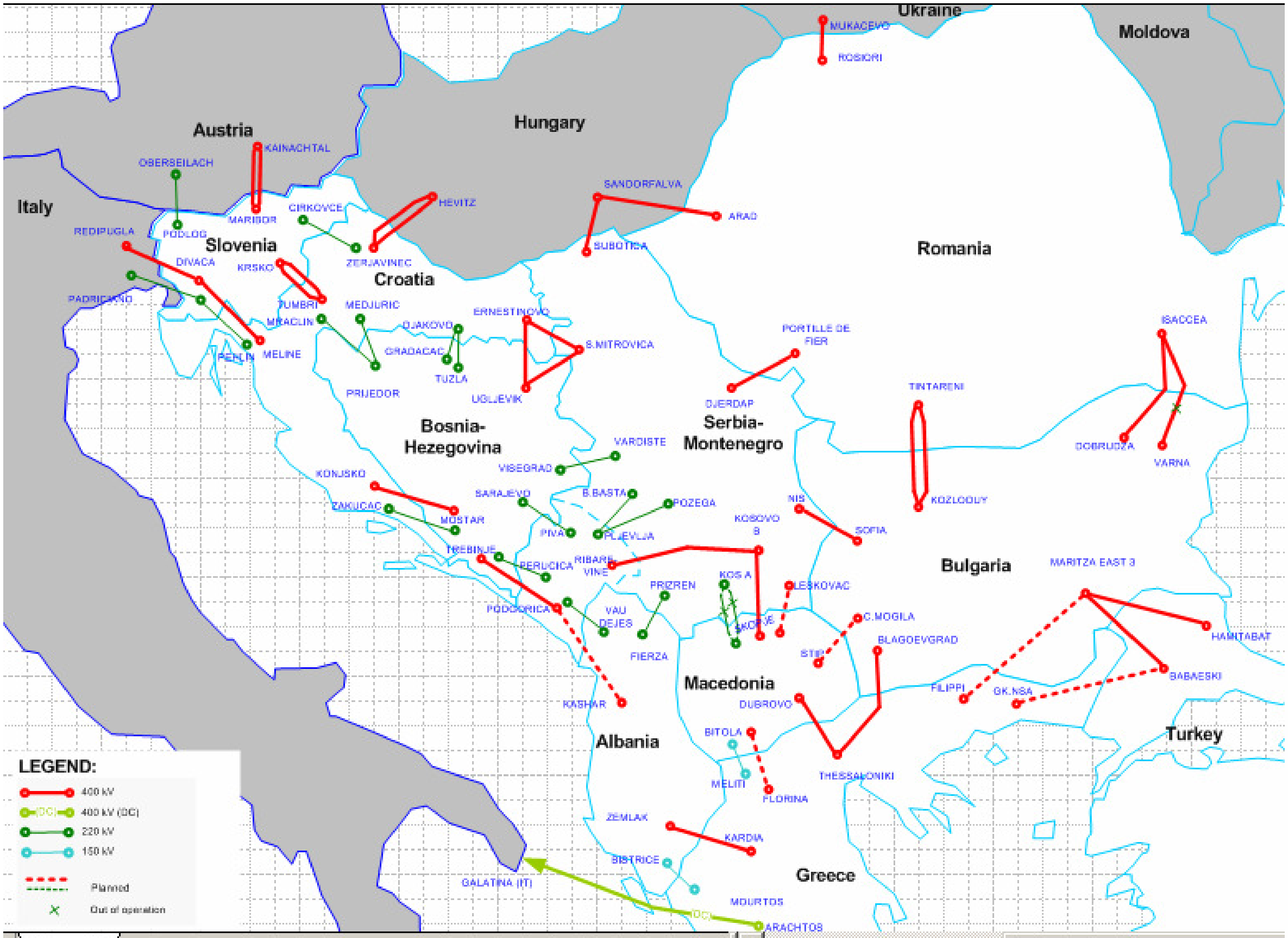
- transmission network operation -

- Insufficient cross-border transmission capacities
- Internal (national) network bottlenecks
- „n-1“ security criteria often not completely followed
- Available power capacity (for primary and secondary control) and service performance satisfactory
- Voltage quality norms at connection points not always met (lack of compensation equipment)
- Insufficient monitoring, remote control, metering and communication facilities

Infrastructure Development
- transmission -

- Significant investment plans for new transmission lines, both cross-borde and internal
- Significant investment plans for refurbishment and upgrading of existing transmission lines and substations
- Significant investment plans for upgrading of existing transmission network control infrastructure
- Insufficient own financial funds to carry out the plans mentioned above
- Transmission price control at different stages of development. Main issues:
  - Recovery of transmission revenue requirements in the unbundled industry
  - Regulatory incentives for new investments
  - Treatment of revenues from ITC scheme and interconnection capacity allocation

Regional Interconnections



Infrastructure Development
- generation -

- Realistic plans (and execution) in Slovenia, Croatia and Bulgaria (Maritsa East 1)
- Other countries more at stage of strategy development or project feasibility studies
- High dependency on foreign credit lines for each investment
- Private capital barriers
  - General risk perception related to the country profile
  - Objectives difficulties resulting from deregulation of generation business
  - Insufficient regulatory incentives for investments in new generation

Legal Framework

- Primary legislation present in all countries
- Effective secondary legislation (Grid Code and Market Rules) exists in Slovenia, Romania and Bulgaria
- Unbundling started
  - TSO legally separated
  - Holding model for generation and distribution / supply activities rather popular
  - Separation of distribution from supply activities not effective yet (except in Slovenia, Romania and Bulgaria)
- Different level of unbundling but similar road-map in most of the assessed countries
- Regional coordination present through Athens Forum initiatives and DG TREN support (SEE Energy Community)
- Regional Grid Code and Market Rules currently discussed

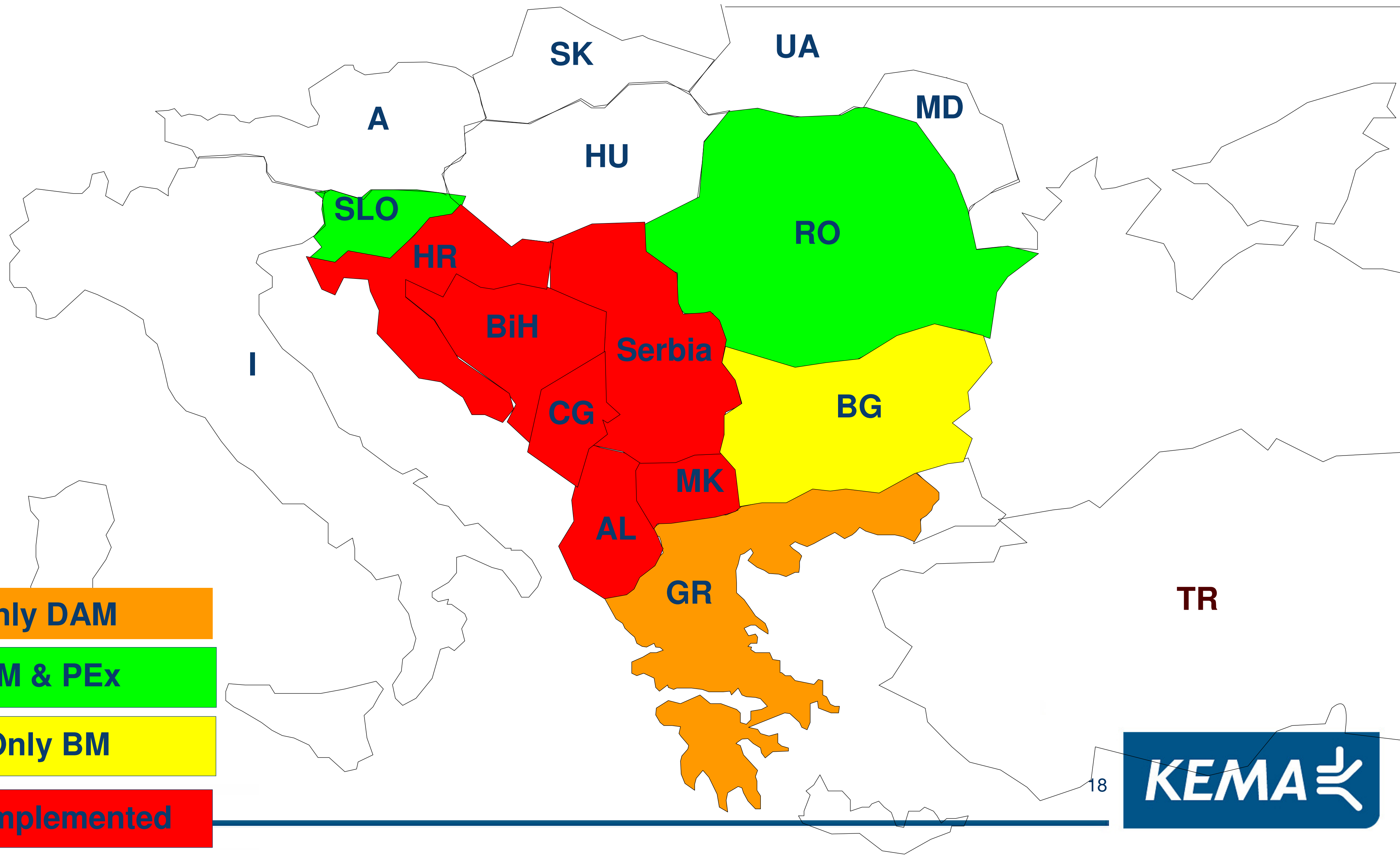
Market Design

- cross-border transmission capacity allocation -

- Insufficient cross-border transmission capacities between all regional power systems and from the region towards rest of UCTE
- In some cases substantial difference between NTC and ATC
- Explicit auctions for cross-border transmission capacity
- No auctions for cross-border transmission capacity in Croatia and Macedonia (at the Greek border)
- Coordinated auctions aimed

Market Design

- market models 1-



Only DAM

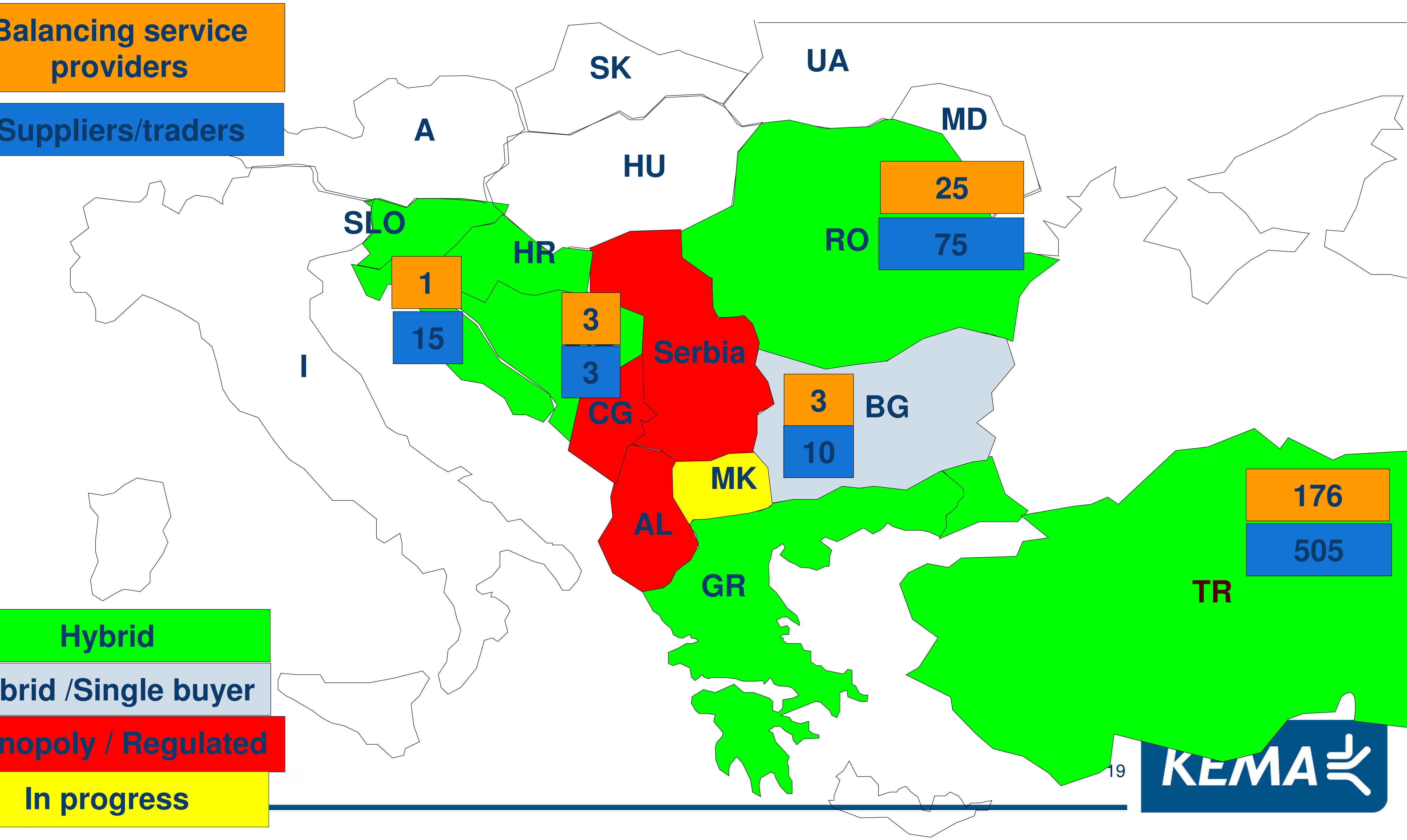
BM & PEx

Only BM

lot implemented

Market Design

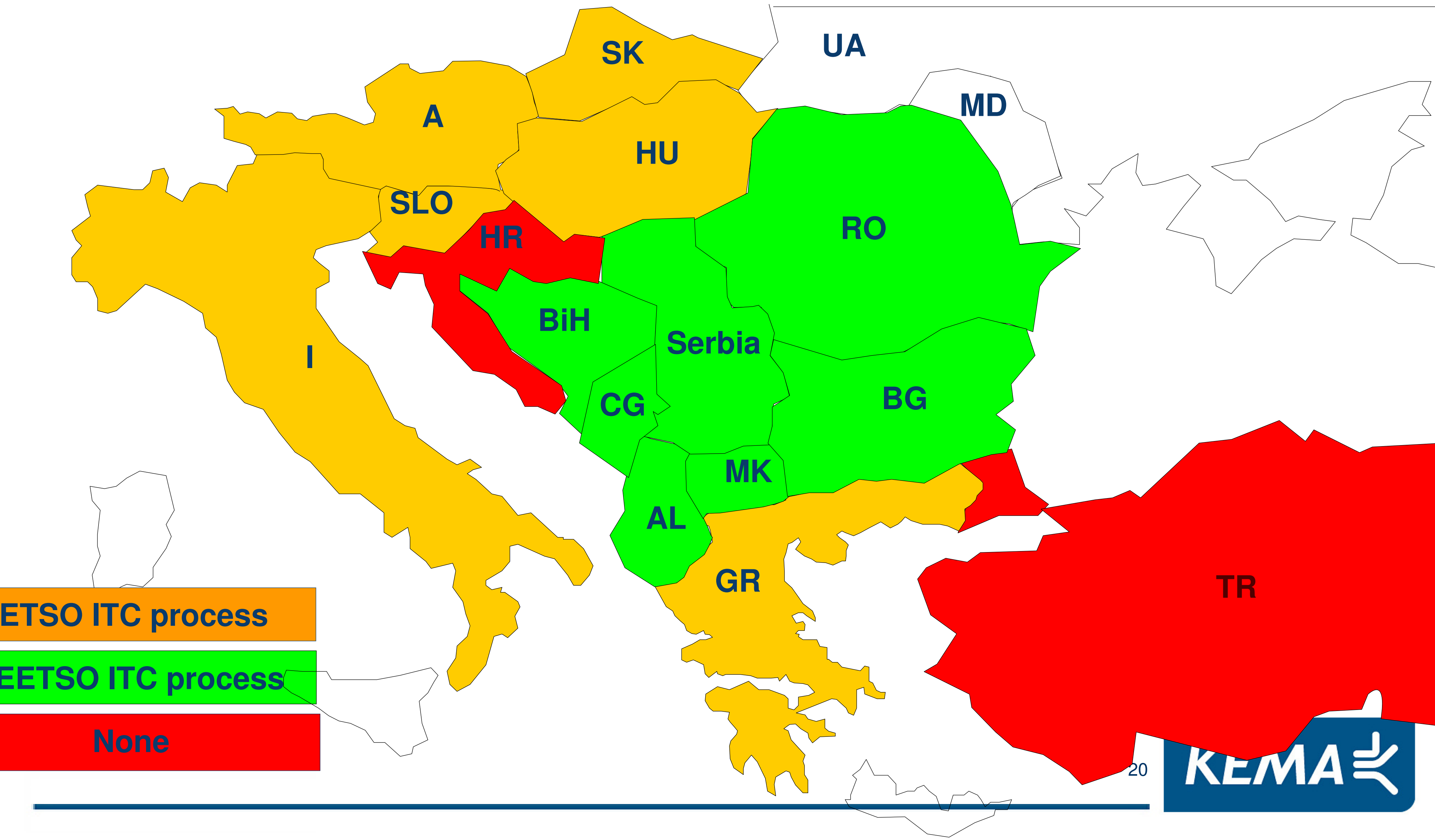
- market model 2 -



Market Design

- CBT/ITC -

Participation in the present CBT/ITC processes



Market Design – Summary

- Market opening still ongoing (Slovenia, Romania, Bulgaria lead)
- Existence of dominant national players resulting from the former vertically integrated structures (except in Romania and Bulgaria where the generation and distribution was horizontally unbundled)
- Regional wholesale electricity market/power exchange will bring benefits
  - Improve competitive performance
  - Increase liquidity
  - Improve reliability

Restructuring Efforts

- Significant progress in the restructuring process in 2005 and 2006:
  - regulatory framework is/will be completed, including tariffs structure and licensing process
  - TSO unbundling is/will be completed
  - generation/distribution/trade of electricity is/will be fully separated
- Initial privatisation steps completed in this period
- Strong impulses by the SEE Energy Community Treaty which foresees full compliance with the current EU legislation
- Dry-run of the regional coordinated allocation of cross-border transmission capacities

KEMA

Regulation

- Incentive regulation schemes for networks implemented (Kosovo, Macedonia, Romania, Bulgaria, Slovenia)
- Cost of service regulation for networks - Albania, Bosnia and Herzegovina, Montenegro, Serbia, Croatia
- Regulatory market surveillance in Romania
- Regulated generation prices in many of the countries
- Supplier-of-last-resort concepts in Romania and Bulgaria
- Promotional schemes for CHPs and renewables
- Regulated end user prices (in particular for small commercial customers and household)

Environmental Aspects

- Strong attention to environmental policy, however not always effective
- Slovenia applies consistent approach with concrete results
- Investments in environmental projects (result of the EU membership of Slovenia, Bulgaria and Romania)
- Action plans limited to TPP emissions reduction, generally associated with rehabilitation
- Main problem - lack of funds for this purpose
  - This relates not only to power sector

Conclusions

- Growing net import of electricity in the region
- Infrastructure investments crucial, still funding constraints
- Significant changes in the organisation and operation of the countries' power sectors
- Deregulation efforts in the area of generation and supply
- Competition on internal markets not fully effective yet
- Substantial regulatory developments, however regulators in many cases under political pressure
- Still long way ahead towards regional electricity market