

NETWORK DEVELOPMENT PLANS – REGULATORY REVIEW

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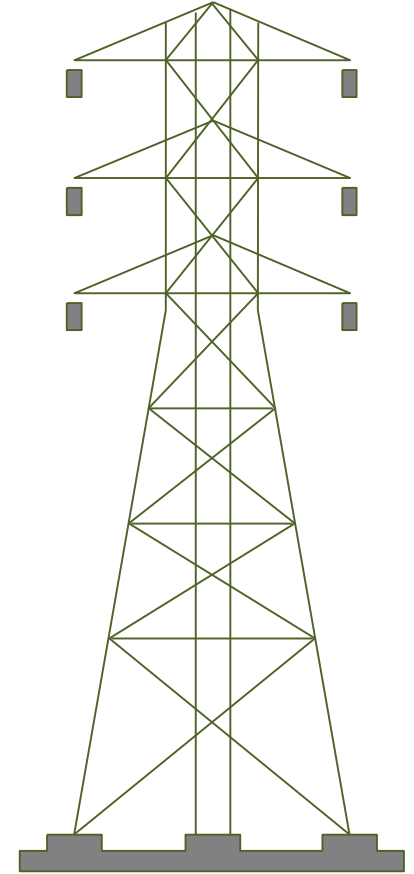
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CONTENTS

- INTRODUCTION
- REGULATORY REVIEW OF THE PLANS
- REGIONAL PLANNING: PECI/PMI SELECTION PROCESS 2020



INTRODUCTION

NETWORK DEVELOPMENT

TSOs ARE OBLIGED FOR NETWORK PLANNING AND DEVELOPMENT IN ORDER TO MAINTAIN HIGH LEVEL OF SYSTEM **SECURITY** AND **RELIABILITY**

LOAD GROWTH

NEW USERS

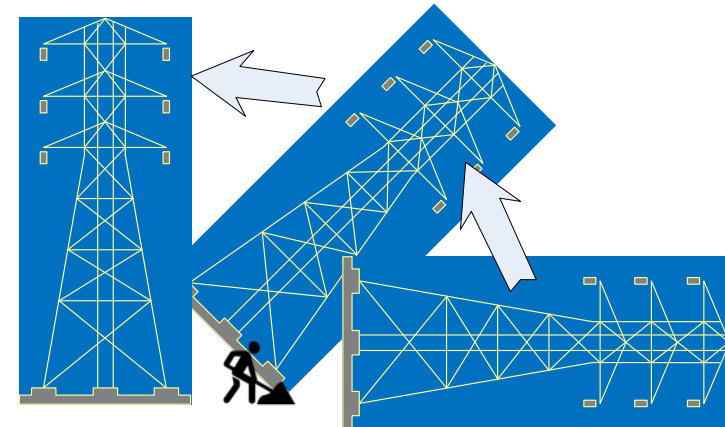
MARKET
COMPETITION

SECURITY OF
SUPPLY

AGEING

RELIABILITY/RESILIENCE/
FLEXIBILITY

DECARBONISATION/SUSTAINABILITY/
INOVATIONS



PLANNING CRITERIA

- DETERMINISTIC
 - N-1
 - N-1-1
 - N-k
- PROBABILISTIC
 - ENS
 - LOLE ...
- TECHNICAL
 - security
 - stability
 - power quality...
- ECONOMIC
 - $NPV > 0$
 - $B / C > 1$...

COMPUTER SIMULATIONS

- NETWORK SIMULATIONS
 - LOAD FLOW
 - SHORT CIRCUIT
 - STABILITY
 - RELIABILITY ASSESSMENT
- MARKET SIMULATIONS

FUTURE SCENARIOS AND UNCERTAINTIES

- AVERAGE TIME TO CONSTRUCT NEW TRANSMISSION LINE: 3 – 15 YEARS
- DECENTRALIZED PRODUCTION
- INTERMITTENT POWER SOURCES
- MARKET TRANSACTIONS
- EMERGING TECHNOLOGIES
- TRADITIONAL UNCERTAINTIES:
 - demand
 - hydrology
 - production costs ...



SOURCES OF RISK



REGULATORY REVIEW OF THE PLANS

GENERAL OVERVIEW

- TSOs PREPARE NETWORK DEVELOPMENT PLANS (1Y, 3Y, 5Y, 10Y)
- REGULATORY AGENCIES APPROVE THESE PLANS
- INVESTMENT COSTS TO BE INCLUDED INTO TRANSMISSION FEES
- PROJECTS OF REGIONAL AND/OR NATIONAL SIGNIFICANCE



REGULATORY REVIEW

- **TRANSPARENCY / STANDARDIZED FORMAT**
 - Contents
 - Procedures / deadlines
 - Methodology / review criteria
 - Financial impact / source of financing
 - Monitoring / reporting ...
- **REVIEW AGAINST PREDEFINED METHODOLOGY/CRITERIA**
 - Project rationale / explanation
 - Calculation results (to prove that a project is the best option to solve specific issue)
 - Technical and economic planning criteria (n-1, n-1-1, NPV>0)

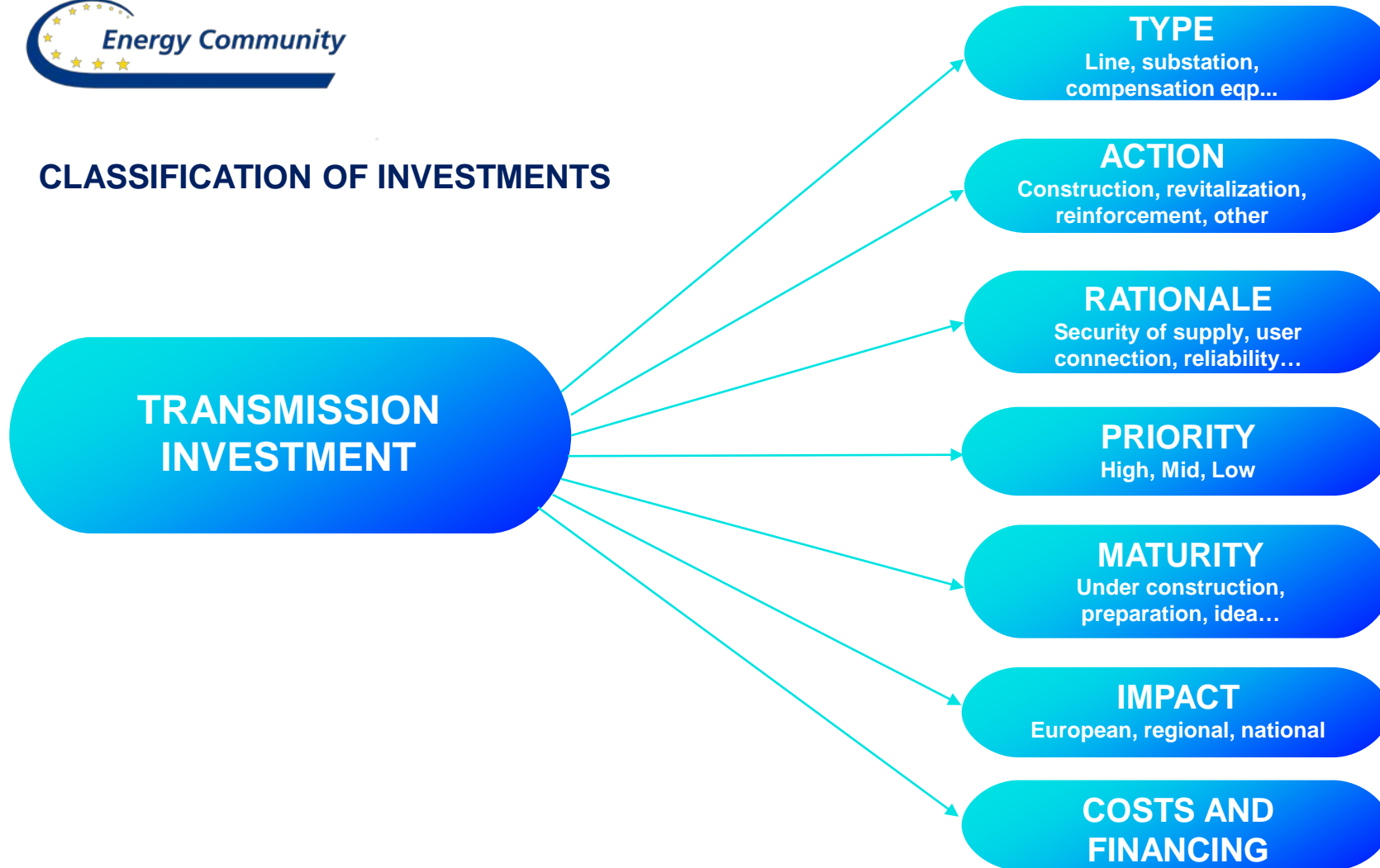


Source: Author

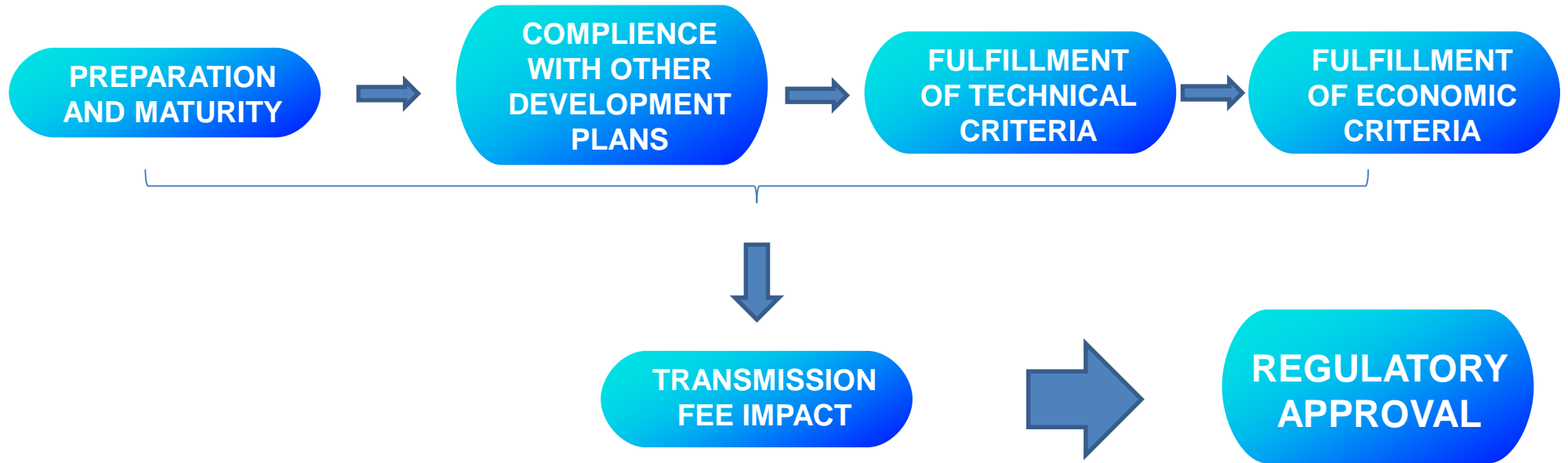
EXAMPLES OF GOOD PRACTICE

- KOSOVO*, MONTENEGRO
- SLOVENIA, ITALY

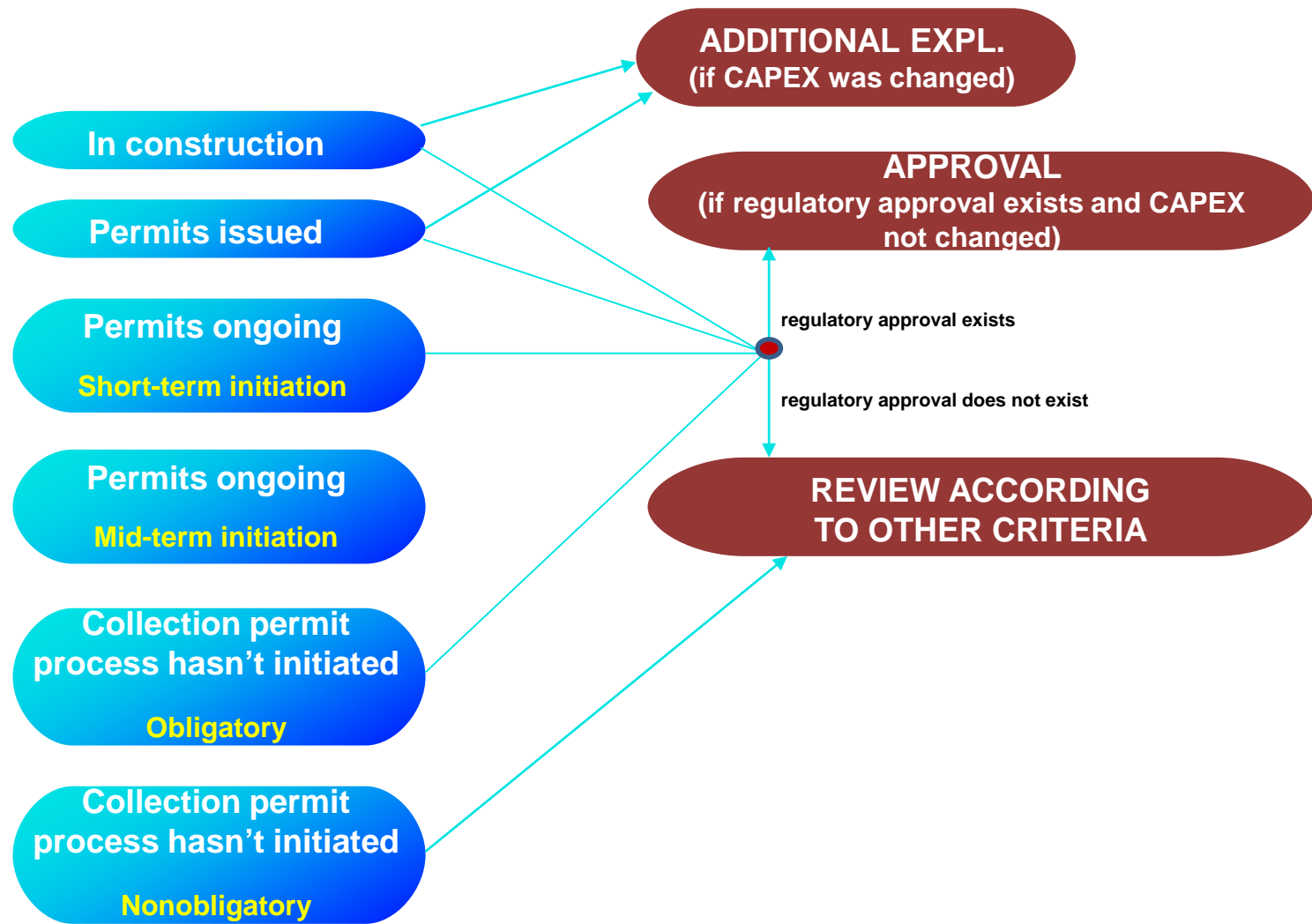
CLASSIFICATION OF INVESTMENTS



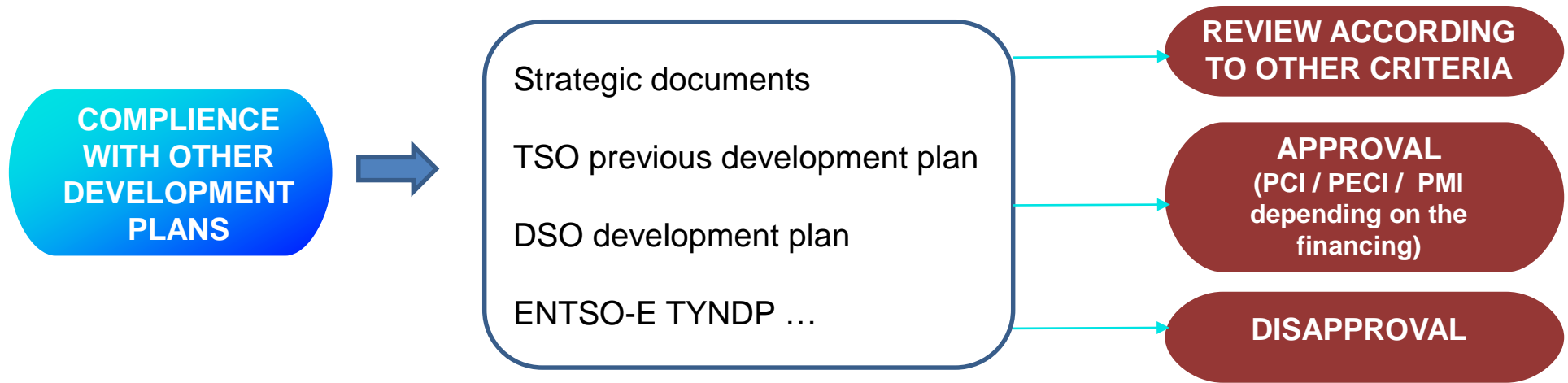
REVIEW CRITERIA



REVIEW CRITERIA
(example of project's maturity evaluation)



REVIEW CRITERIA (cont.)



REVIEW CRITERIA (cont.)

**FULFILLMENT
OF TECHNICAL
CRITERIA**



New users connection including
necessary network reinforcements

Security of operation and supply
(n-1, n-1-1, stability, short-circuit...)

Voltage control & other AS / power
quality

Cross-border reinforcements

Modernisation / revitalisation

...

**REVIEW ACCORDING
TO ECONOMIC
CRITERIA**

APPROVAL

DISAPPROVAL

REVIEW CRITERIA (cont.)

**FULFILLMENT
OF ECONOMIC
CRITERIA**



Projects with CAPEX above
certain threshold

CBA analysis

NPV > 0

B/C ratio > 1

IRR > d

Sensitivity analysis / risk
management

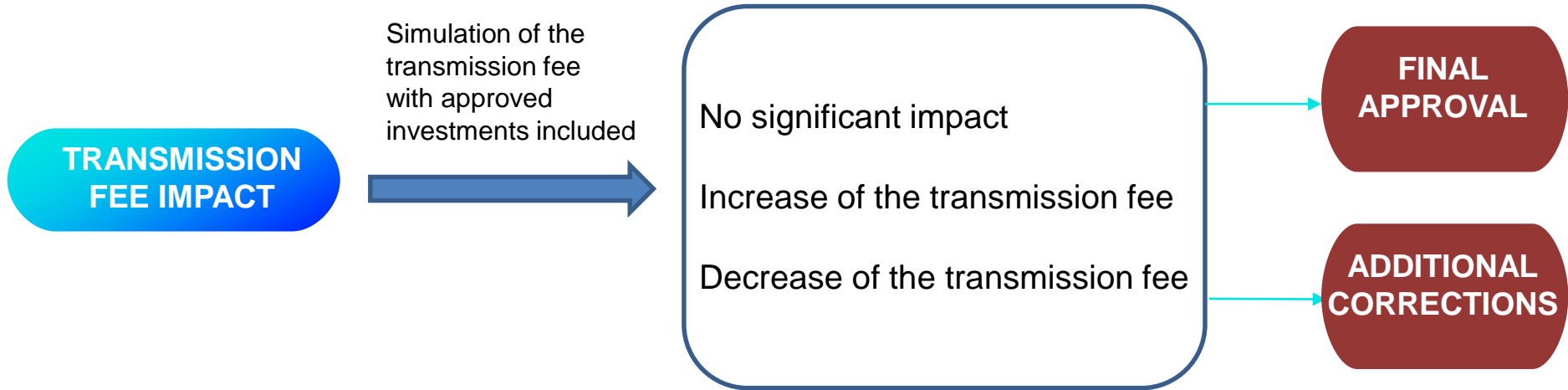
APPROVAL

- economic criteria met
- low level of risk
- mid to high level of risk, risk management measures well defined

DISAPPROVAL

- economic criteria not met
- high level of risk, no risk management measures

REVIEW CRITERIA (cont.)



REGIONAL PLANNING: PECI/PMI SELECTION PROCESS 2020

BACKGROUND

- **REGULATION 714/2009** on conditions for access to the network for cross-border exchanges in electricity (ENTSO-E TYNDP)
- **REGULATION 347/2013** on guidelines for trans-European energy infrastructure
 - PCI PROJECTS
 - PECI / PMI PROJECTS ADAPTED IN EnC
 - PROMOTION OF PROJECTS OF EUROPEAN / REGIONAL SIGNIFICANCE
 - Electricity, gas, oil infrastructure
 - Smart grid
 - Storage
 - Electricity highways, carbon dioxide networks...

R347 Implementation

	National Competent Authority	Manual of procedures	Methodology and the criteria used to evaluate investment with the higher risks	Total %
WF	0.4	0.3	0.3	
AL	70%	30%	0%	37%
BA	30%	30%	0%	21%
KS*	70%	100%	100%	88%
MD	30%	30%	0%	21%
ME	30%	10%	100%	45%
MK	30%	30%	0%	21%
RS	70%	30%	30%	46%
UA	30%	0%	30%	21%
GE	0%	10%	10%	6%

30% draft decision, law, by-law
70% adapted and designated
100% operational

30% first general draft
70% final draft/national specifics
100% published

30% first general draft
70% final draft/national specifics
100% published

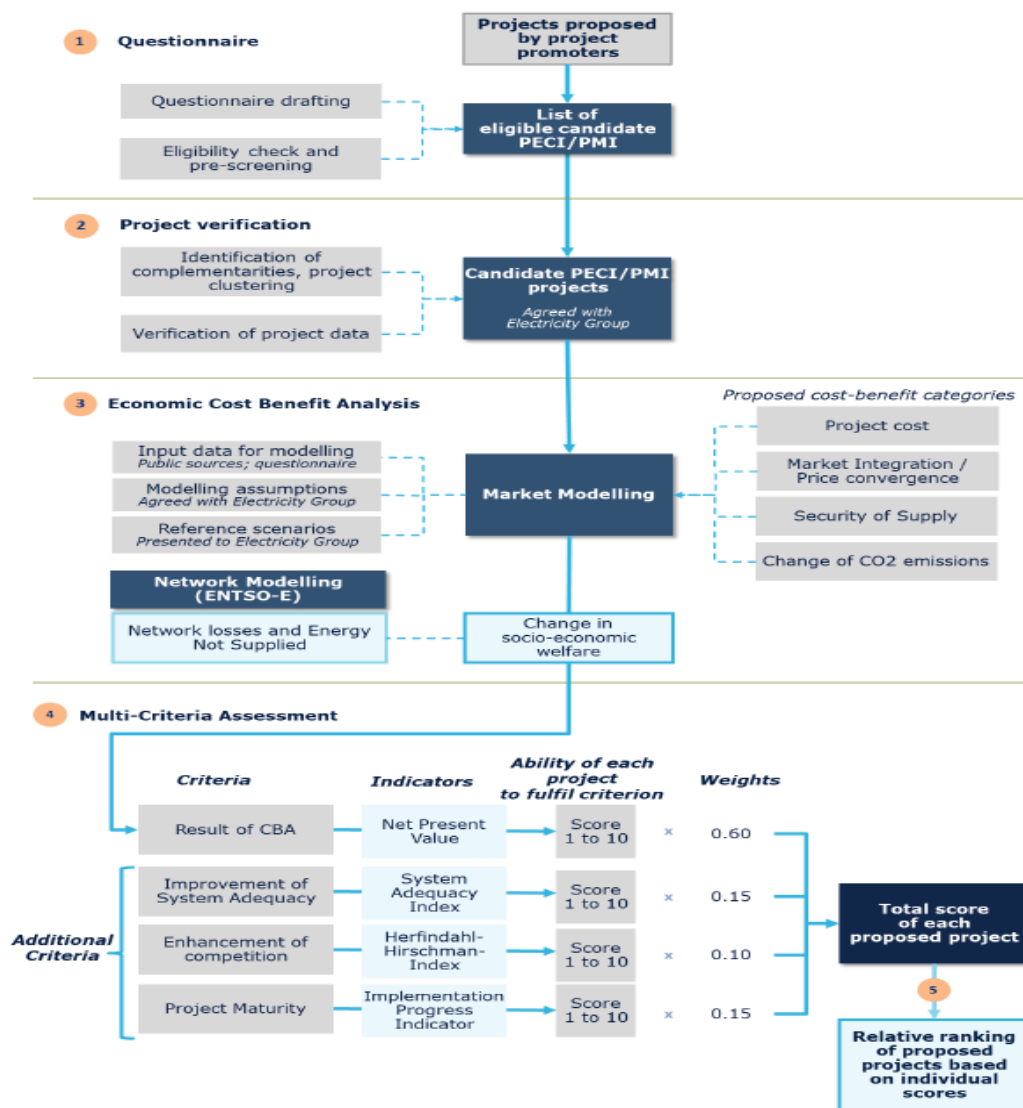
PROCESS

- PECCI/PMI SELECTION 2020
 - JANUARY 2020 – JUNE 2020
 - PROMOTORS SENT CANDIDATE PROJECTS
 - SELECTION BASED ON SOCIO-ECONOMIC ANALYSIS AND MULTI-CRITERIA ASSESSMENT
 - cross-border impact
 - potential benefits shall outweigh its costs

	Electricity transmission	Electricity storage	Gas transmission	Gas storage	LNG	Smart grid	Oil	Total
Number of projects	6	0	19	1	0	0	3	29
Submitted investment cost (million €)	2879	-	7980	75	-	-	431	11 365

METHODOLOGY

- DATA COLLECTION
- ELIGIBILITY CHECK/VERIFICATION
- CBA ANALYSIS
 - Market modelling (2 scenarios)
 - Market simulations
 - Other benefits (losses & ENS)
- MULTI-CRITERIA ASSESSMENT



Source: REKK, DNV GL

RESULTS (example: Electricity)

Project code	Country	Welfare change, m€				Investment cost, m€	OM cost, m€	Transmission loss reduction benefit, m€	ENS benefit, m€	NPV, m€	B/C
		Consumer	Producer	Rent	Subtotal						
EI_01	BA-ME-RS	1674	-849	-519	307	X	-21.6	15.5	0.7	154.9	1.92
EI_03	BA-HR	337	-229	-78	31	X	-4.7	2.2	0.0	-92.8	0.26
EI_07	UA_W-SK	245	-16	-49	180	X	-0.2	0.0	0.0	164.4	11.59
EI_09	UA_E-RO	1627	-915	1119	1831	X	-4.1	0.0	0.0	1509.8	5.69
EI_12	RS-RO	28	18	-40	6	X	-6.4	-2.0	0.6	-39.7	0.10
EI_13	GE-RO	2697	-2591	1818	1924	X	-426	-194.2	1.2	-252.1	0.87

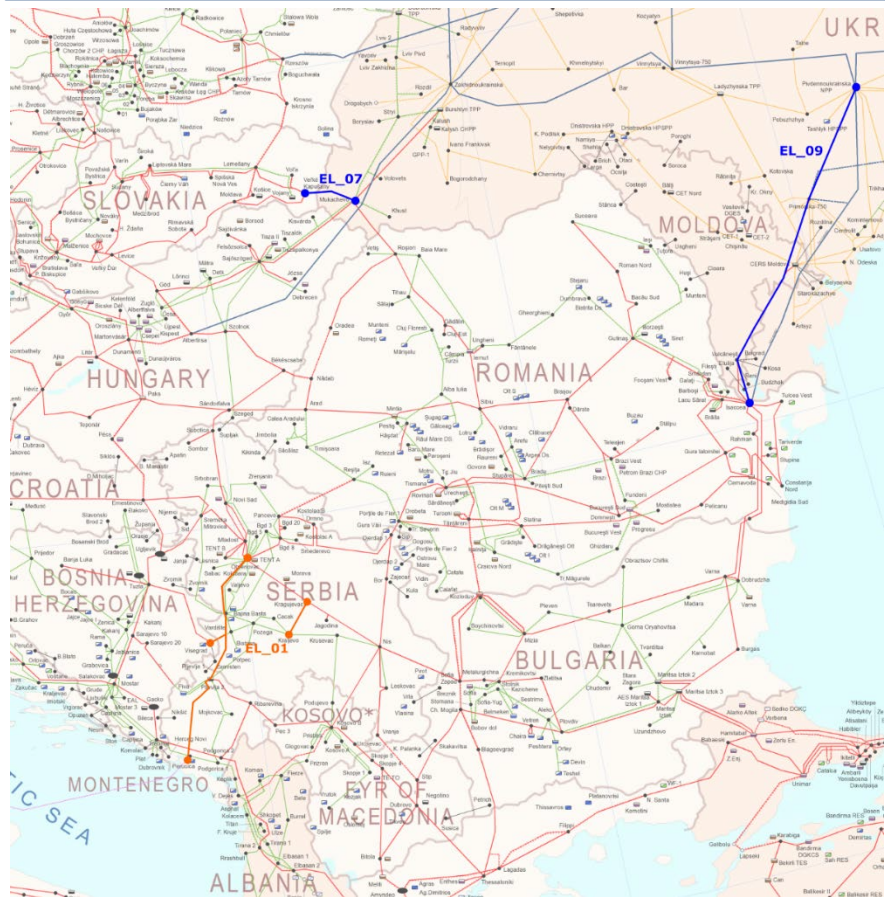
Source: REKK, DNV GL

RESULTS (example: Electricity)

Project Code	Countries	Change in Indicator due to Project				Scores of Indicators [Scale 1 (min) to 10 (max)]				Weighted Scores of Indicators				Total Score
		Benefit-Cost Ratio (B/C ratio)	System Adequacy Index (SAI)	Herfindahl-Hirschman-Index (HHI)	Implementation Progress Indicator (IPI)	B/C ratio	SAI	HHI	IPI	B/C ratio (60%)	SAI (15%)	HHI (10%)	IPI (15%)	
EL_01	RS-BA	3.97	1.22	-599.30	6	5.59	10.00	10.00	6	3.35	1.50	1.00	0.90	6.75
EL_03	BA-HR	0.19	0.43	-175.91	5	0.00	3.52	2.53	5	0.00	0.53	0.25	0.75	1.53
EL_07	UA-SK	7.08	0.15	-216.78	1	10.00	1.17	3.25	1	6.00	0.18	0.32	0.15	6.65
EL_09	UA-RO	5.77	0.15	-89.43	-9	8.14	1.15	1.00	-9	4.89	0.17	0.10	-1.35	3.81
EL_12	RS-RO	0.06	0.13	-317.66	1	0.00	1.00	5.03	1	0.00	0.15	0.50	0.15	0.80
EL_13	GE-RO	0.74	0.45	-137.82	1	0.00	3.62	1.85	1	0.00	0.54	0.19	0.15	0.88

Source: REKK, DNV GL

- PECE/PMI selection process: January 2020 – June 2020
- 6 electricity infrastructure, 20 gas, 3 oil, 0 smart grid candidate projects were evaluated



List of PECE in Electricity

- EL_01** **Transbalkan corridor**
- New 400 kV OHL SS Kragujevac 2 (RS) – SS Kraljevo 3 (RS), with voltage level upgrade in SS Kraljevo 3 (RS) to 400 kV voltage level
 - New double circuit 400 kV OHL SS Obrenovac (RS) – SS Bajina Basta (RS) with upgrade of SS Bajina Basta (RS) to 400 kV
 - New 400 kV interconnection between SS Bajina Basta (RS) - Visegrad (BA) - Pljevlja (ME)

List of PMI in Electricity

- EL_07** **400 kV Mukacheve (Ukraine) – V.Kapusany (Slovakia) OHL rehabilitation**
- EL_09** **750 kV Pivdennoukrainska (Ukraine) – Isaccea (Romania) OHL rehabilitation and modernization**
- Upgrade and extension of the internal line within Ukraine; Yuzo Ukrainska-Prymorska
 - Upgrade and extension of the cross-border line between Ukraine and Romania; Prymorska – Issacea



PECI - Gas

#	Project Name	Cluster
Gas_13	Albania-Kosovo* Gas Pipeline - ALKOGAP	Supplying Kosovo* competing projects' cluster
Gas_26	North Macedonia–Kosovo* Interconnector	Supplying Kosovo* competing projects' cluster
Gas_11	Interconnector Serbia-North Macedonia	Supplying North Macedonia competing projects' cluster
Gas_09	Interconnector Bulgaria-Serbia (PCI) as a competing project with TurkStream expansion in Serbia (Gastrans project)	N/A

PMI - Gas

#	Project Name	Cluster
Gas_29	SCP Georgian Offtake Expansion for EU LNG Swap	N/A
Gas_10	Gas Interconnector Serbia-Croatia (Phase I)	N/A
Gas_28	Trans-Anatolian Pipeline Expansion - TANAPX	Southern Gas Corridor Expansion-TANAPX-SCPFX-IAP
Gas_22	South Caucasus Pipeline Further Expansion - SCPFX	Southern Gas Corridor Expansion-TANAPX-SCPFX-IAP
Gas_16	Ionian Adriatic Pipeline - IAP	Southern Gas Corridor Expansion-TANAPX-SCPFX-IAP
Gas_4b	Interconnector Greece-North Macedonia	Supplying North Macedonia competing projects' cluster
Gas_01	Interconnector Bosnia and Herzegovina - Croatia North	Supplying Bosnia and Herzegovina competing projects' cluster
Gas_03	Interconnector Bosnia and Herzegovina - Croatia South	Supplying Bosnia and Herzegovina competing projects' cluster



THANK YOU FOR YOUR ATTENTION

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