

Navigating Spatial, Environmental and Siting Challenges in Electric Power Facility Development

Croatian experience – design engineer's perspective

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Secretary of Croatian SC B2 Overhead lines

Croatia

- 56 594 km²
- 20 Counties + City of Zagreb with the dual status of city and county
- 128 Cities and 428 Municipalities
- Counties, cities and municipalities adopt spatial/urban plans/detailed urban plans
- Powerlines and substation above 110 kV - infrastructure of significance for the Counties
- County plan over ranks city/municipality spatial plan if they are not in accordance, but in real life there is no automatism, plan changes – very slow process



Usual corridor sizes for OHTLs and areas for substation in County plans

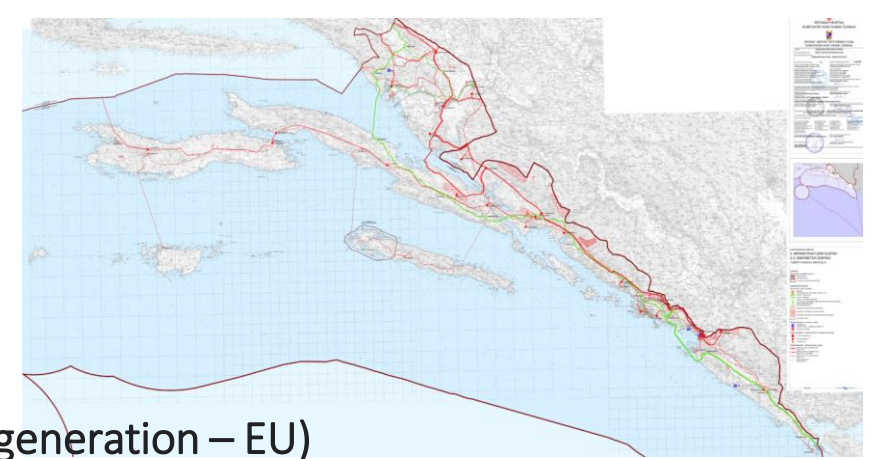
Elektroenergetska mreža		Građevina	Koridor građevine (m)	
Vrsta	Kategorija	Vrsta	postojeća	planirana
Dalekovod/ Kabel	državni	dalekovod 2x400 kV	80	100
		Dalekovod 400 kV	70	80
		Dalekovod 2x220 kV	60	70
		Dalekovod 220 kV	50	60
		Kabel 220 kV	6	12
	županijski	Dalekovod 2x110 kV	50	60
		Dalekovod 110kV	40	50
		Kabel 2x110kV	6	12
		Kabel 110kV	5	10

- *SS 400/x kV - AIS: cca 350x350 m,*
- *SS 400/x kV - GIS: cca 200x200 m,*
- *SS 220/x kV - AIS: cca 250x250 m,*
- *SS 220/x kV - GIS: cca 170x170 m,*
- *SS 110/x kV - AIS: cca 100x100 m,*
- *SS 110/x kV - GIS: cca 60x60 m.*

Spatial plans in the (near) future

1. Spatial plans of new generation: e- Plans (vector data)

– in process of development since last year, with the support of EU funds (Next generation – EU)



2. National (state) plan of spatial development – April 2024 Ministry of Physical Planning and construction announced the Decision of its elaboration

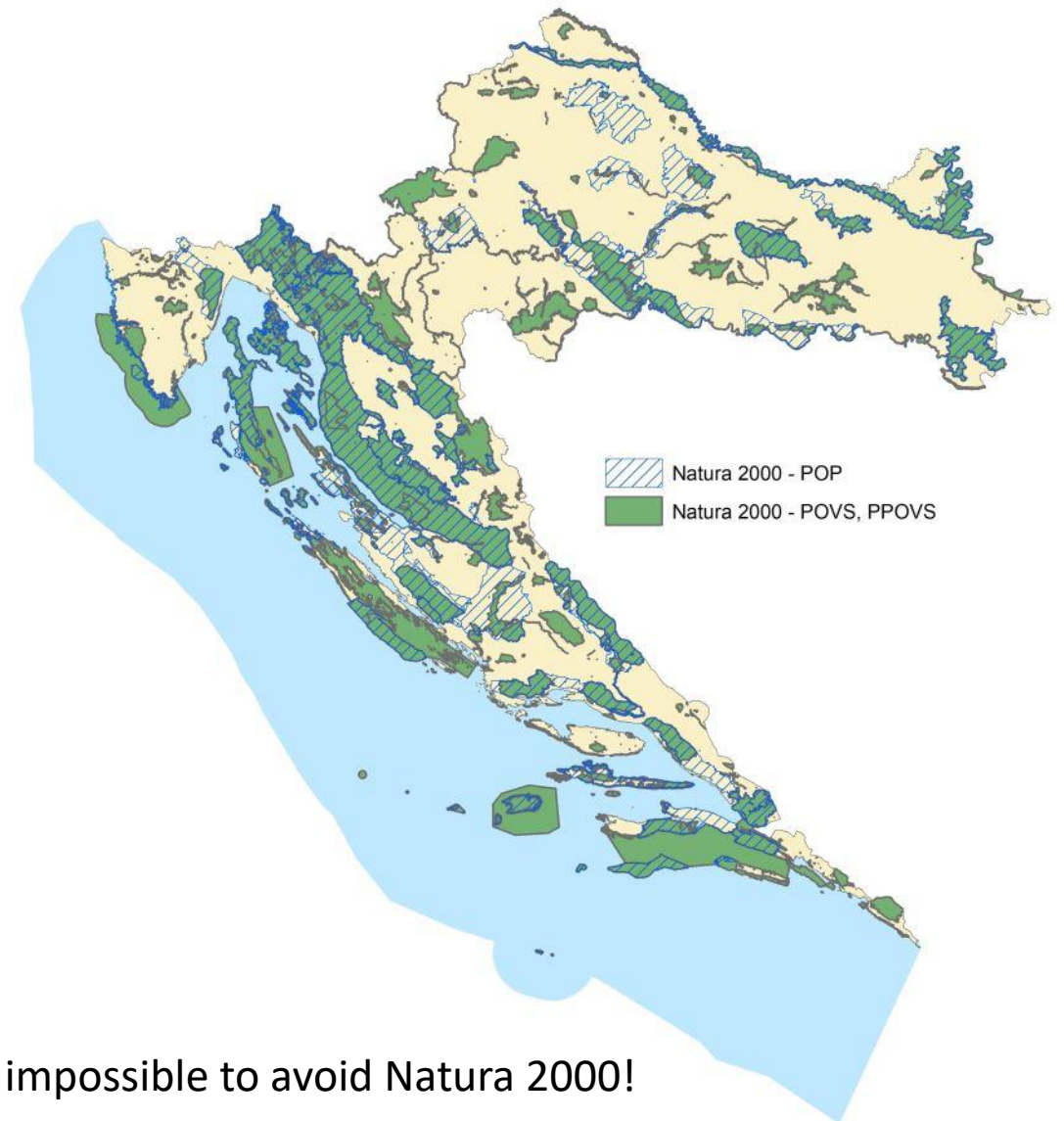
- production and transmission of electrical energy considered to be of state significance

Goal:

Determining the use of space and surfaces and the implementation conditions for infrastructure of state significance determined by this Decision, with the aim of faster development of activities and infrastructure placement in space

NATURA 2000

- 36,8% of land territory and 9,3% of sea territory
- Protection of bird, species and habitats
- mandatory 1 year monitoring in majority of cases for the environmental study
- Long process + very slow administration



Almost impossible to avoid Natura 2000!



Conceptual design and environmental study (current project Lika example)

New 2x400 kV lines from SS Lika to Konjsko (Split), Melina (Rijeka) and Tubmbri/Veleševec (Zagreb) (app. 400 km)

Conceptual design and environmental study (current project Lika example)

Project Lika: Evacuation of energy from RES from the south to the north of Croatia – crucial for green energy transition

Line routes are included in physical planning documents, except for Ličko – senjska county – inscription of the line route and substation Lika to the spatial plan lasts **since 2019!**

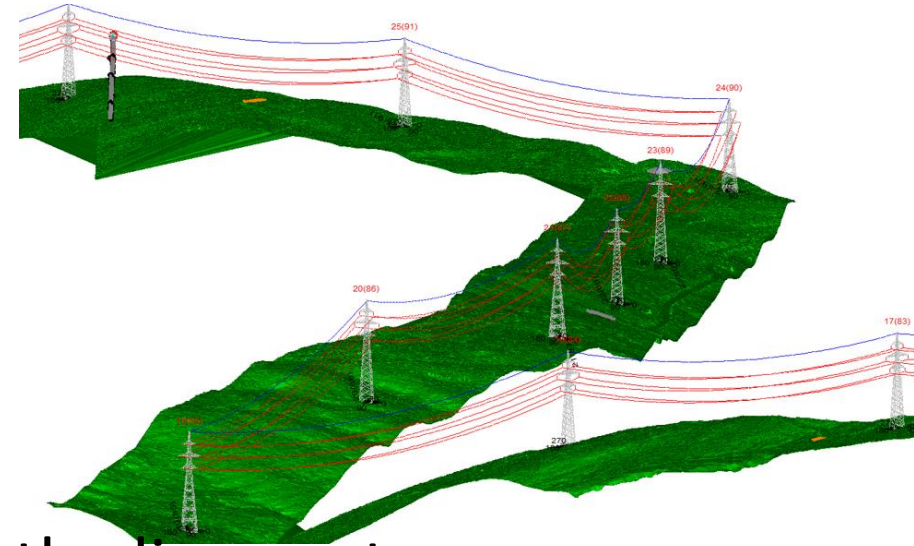


Conceptual design and environmental study (current Project Lika example)

- Based on Feasibility study and spatial plans
- Serves for Environmental study

Includes:

topographic LIDAR survey, site visit, fine tuning of the line route, tower spotting, tower shape definition, foundation size estimation based on preliminary geotechnical data, detailed spatial plan analysis and existing infrastructure analysis, defining access roads for towers, defining corridor for tree cutting, analysis of land property status



Environmental approval procedure

- Impact on nature (Natura 2000 and vicinity of Natura 2000 areas)
- Impact on environment (lines and substations above 110 kV)
- Environmental study – 6 -18 month of elaboration (monitoring included) (air, soil, biodiversity, wildlife, climate, forests, landscape, cultural and historical heritage, light pollution, settlements, residents, local economy, other infrastructure)
- Environmental “permit” procedure – 6 month according to regulations but it takes 4 – 6 times longer (according to Position paper written by Croatian Chamber of Commerce in March 2024)



Environmental approval procedure

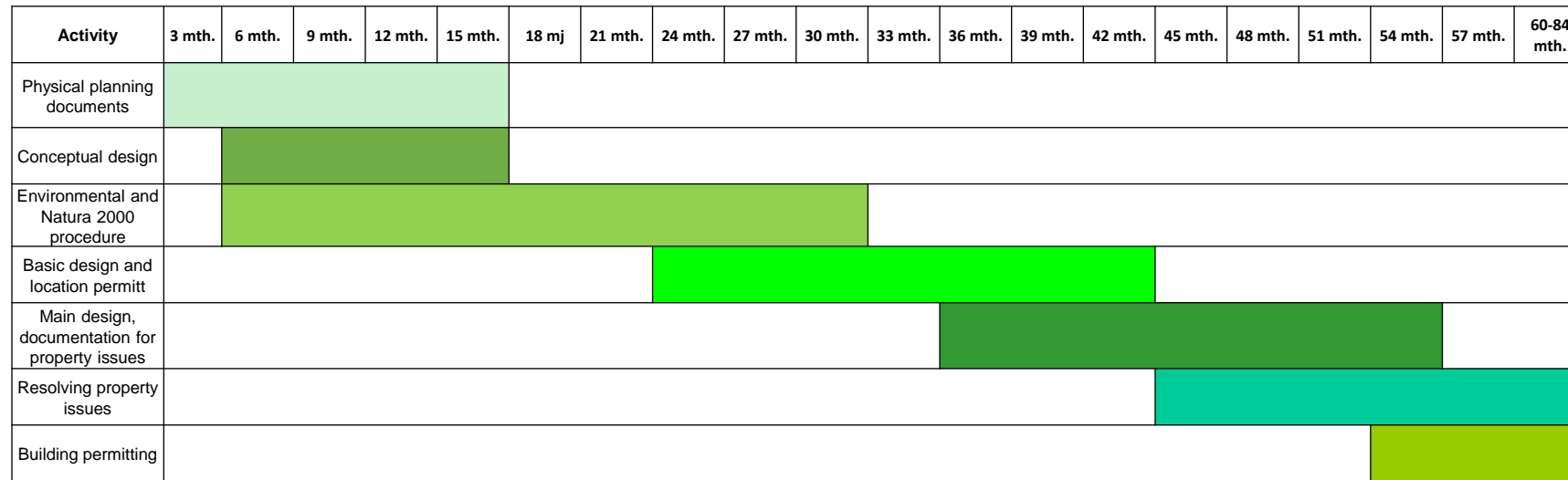


Is the intervention in nature and environment expectable?

Yes, but with Measures of impact mitigation to be considered in later design, construction and operation of the power line/substation, sometimes monitoring (birds, bats) is necessary during the operation

Recently – for 3 km of 2x400 kV OHTL – 105 measures of mitigation of impact (no Natura 2000)!!!!

Gantt chart of activities until building permits are obtained - according to past experiences



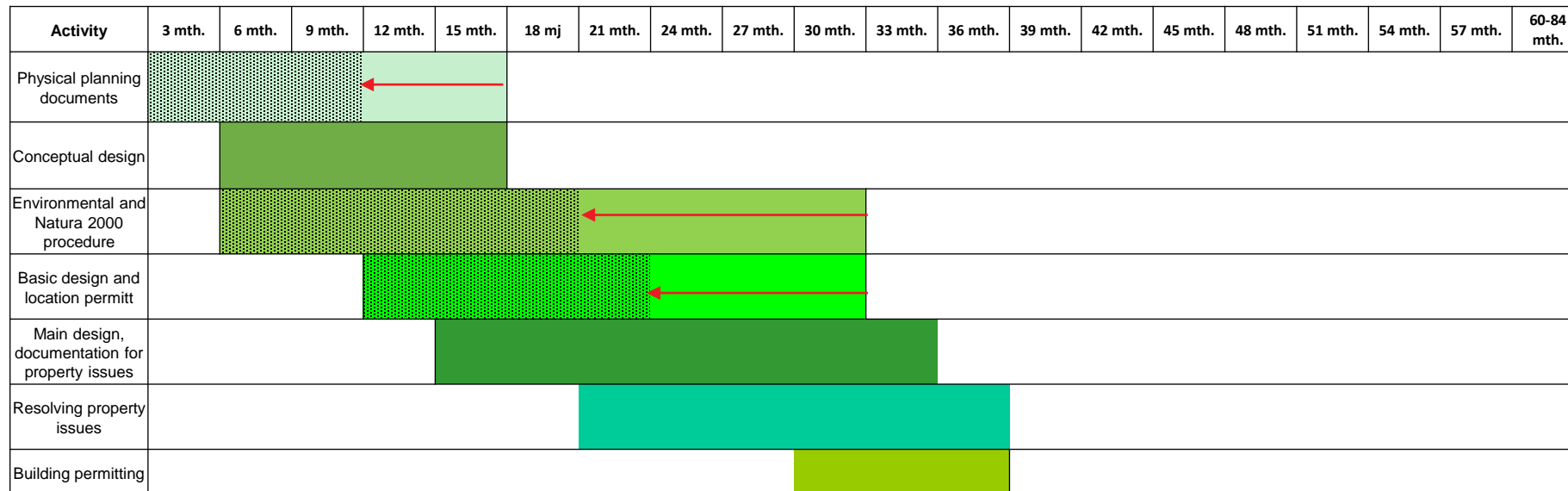
RECOMMENATIONS FOR SPEEDING THE PROCESS

- Intensive collaboration with the ministries of environmental protection, physical planning and construction, ministry of agriculture
- Strategic status of the project (government of Croatia)
- Adoption of the Decision of the Government of the Republic of Croatia on the National Program for the Development and Construction of the 400 kV Transmission Network
- Inclusion of HOPS (Croatian TSO) in the list of legal entities of special interest to the Republic of Croatia

RECOMMENATIONS FOR SPEEDING THE PROCESS

- Amendments to the Law on the Regulation of Property Law Relations for the Purpose of Construction of Infrastructure Buildings (NN 80/2011)
 - Article 1, paragraph (2) to be added with "a legal entity that is owned by a legal entity whose founder is the Republic of Croatia"
 - Article 3, paragraph (1) to be added with "electric power infrastructure" (apart from roads, railways, hydrotechnical infrastructure, communal infrastructure) to ease the regulation of property issues
- Adoption of the State Spatial Development Plan for the power grid
- Adoption of the Law on Electric Power Infrastructure of State Importance, which will regulate the procedures for issuing location and construction permits and securing proof of legal interest

Gantt chart of activities until building permits are obtained – applying the suggested recommendations



Speeding up the process of adoption of physical planning documents



For the sake of uniform treatment, appoint the same persons-experts to all Commissions for the assessment of the impact of interventions on the environment from the level of state bodies and institutions. The deadline for issuing information on the project holder's request for the implementation of the environmental impact assessment procedure and the deadline for the formation of the Commission to be reduced to 30 days from the date of receipt of the request



The decision on the acceptability of environmental interventions should be sought as a condition for the issuance of a Building and not a Location Permit



The possibility of reducing deadlines

Conclusions:

- Ever more demanding requests for conceptual design (almost main design level)
- Complicated and slow environmental approval procedure mainly due to lack of staff in public administration
- Some space for speeding up the process – status of state significance for HOPS (“Lex HOPS”) and strategic status for important projects
- Transmission network development is vital for the successful energy transition, so it is crucial to amend current policies if we want to achieve the EU goals

Thank you for your attention!



7th SEERC Workshop, May 28, 2024, Cavtat, Croatia