

North Adriatic cross-border Hydrogen Valley (NAHV)

Holding Slovenske elektrarne, d.o.o.

February 2023



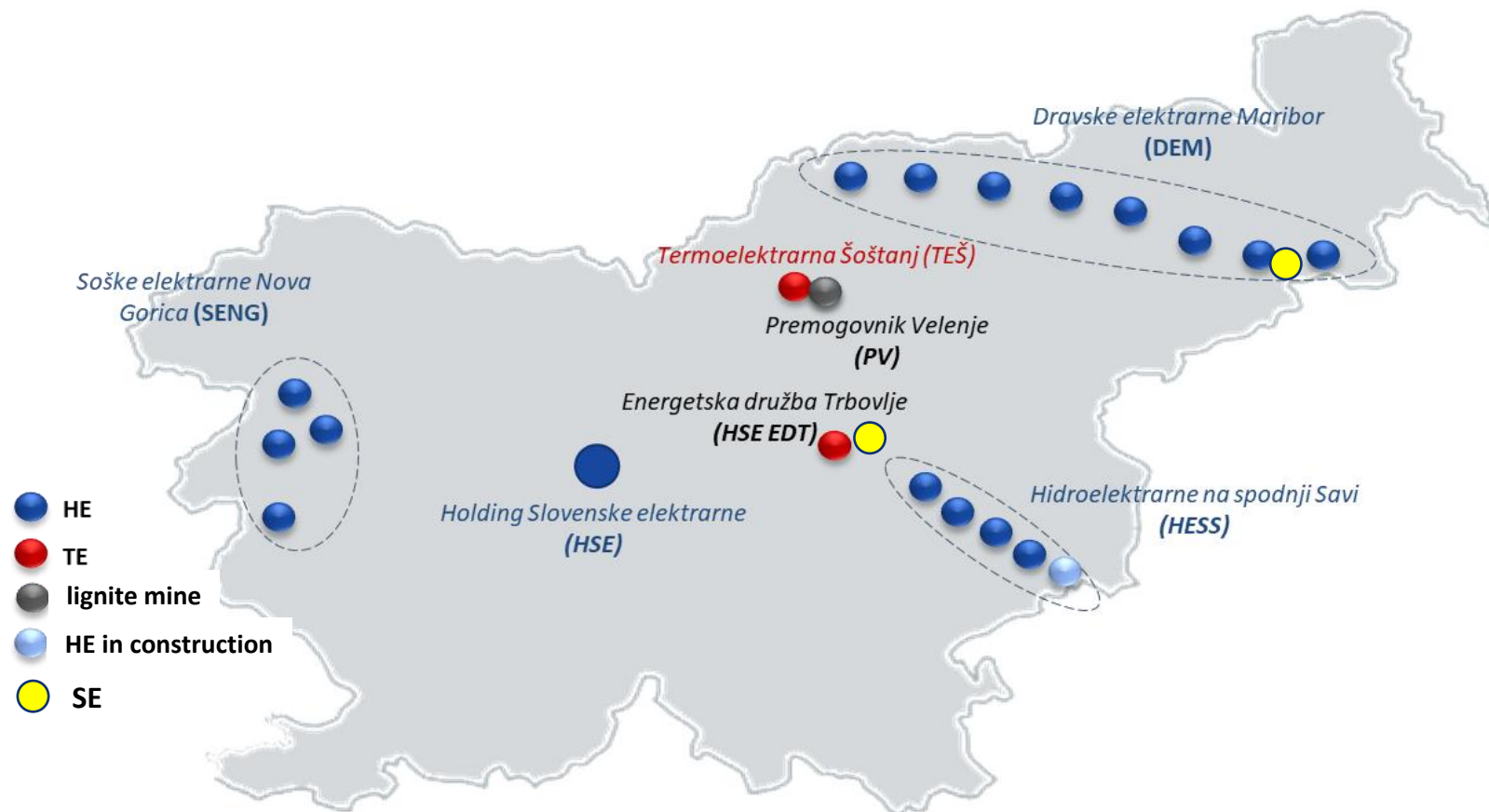
NAHV – Lessons learned (till now)

Holding Slovenske elektrarne

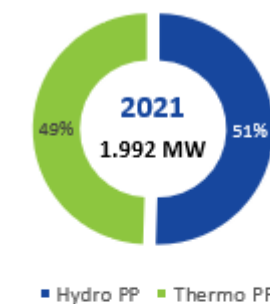
Jerneja Sedlar, PhD,
NAHV project manager



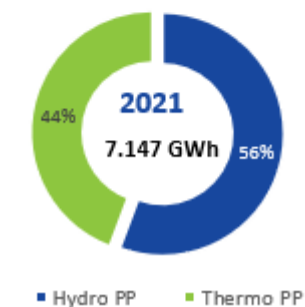
HSE – Production portfolio



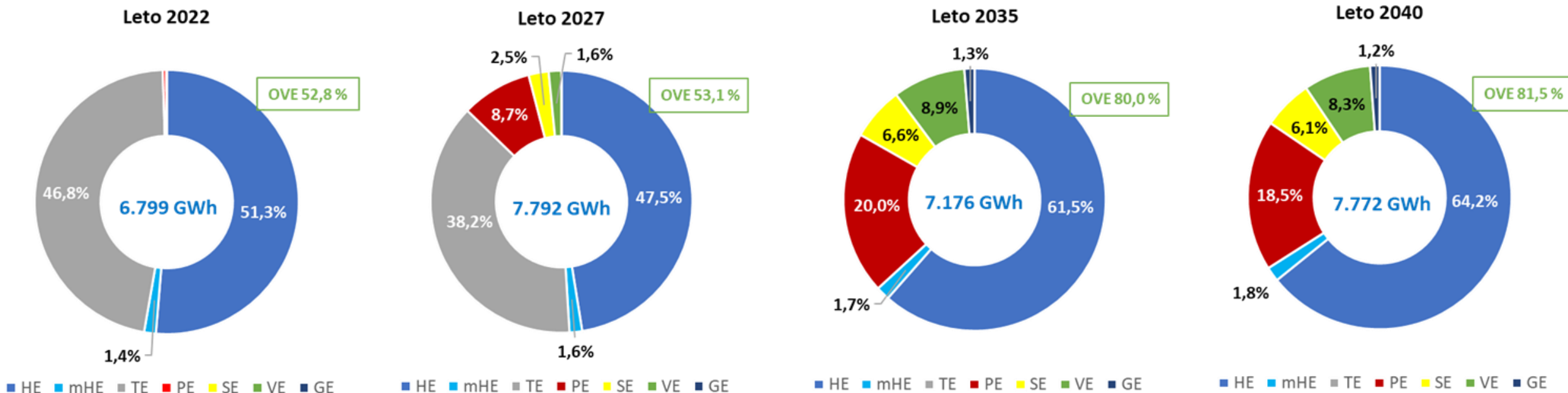
Installed Power (MW)



Production Portfolio (GWh)



HSE's Development plan 2022 – 2040; Portfolio





North Adriatic Hydrogen Valley

Source: Presentation during conference, HYDROGEN ECOSYSTEM NORTH ADRIATIC 2022, Nova Gorica, Slovenia, 27.09.2022



A Time for a history

- Nova Gorica/Gorizia, Europa/Transaplina Square, **November 21st, 2021**,
- Three nations to endorse the support North Adriatic Transnational Hydrogen Valley

Early Announcement of the Project

North Adriatic Cross border Hydrogen Valley

This is how we can accelerate the hydrogen economy

„If we are to meet our climate goals, we need to accelerate in the European hydrogen economy. Hydrogen valleys, are a perfect example of the hydrogen economy we want to build. For example, the Groningen area – in the Northern Netherlands, from the island of Mallorca to the border region between Italy, Slovenia and Croatia. This is how we can accelerate the hydrogen economy on a local scale, on our way towards a European hydrogen economy as a whole.” (Brussels, Hydrogen Week, November 29th, 2021)



November 29th, 2021














Source: Opening keynote by President von der Leyen at the European Hydrogen Week 2021, https://ec.europa.eu/commission/presscorner/detail/en/speech_21_6421,

Path passed till today and Current position

- **24.11.2021** - **Hydrogen Ecosystem North Adriatic 2021, 1st Conference**
- **14.03.2022** - **Letter of intent, Mzi (SLO), MGior (CRO), Reg.Council (FVG) and formation of JWG**
- **31.03.2022** - **Call HORIZON-JTI-CLEANH2-2022**
- **11.04.2022** - **Formation of JWGs in each of three regions**
- **18.05.2022** - **JWG has appointed AREA Science park as technical assistance**
- **08.06.2022** - **MoU, President of the Italian Government and the President of the Region Friuli Venezia Giulia, financing of the Hydrogen Valley**
- **04.08.2022** - **JWG has appointed HSE as Lead partner** 
- **20.09.2022** - **Application submission date**
- **27.09.2022** - **Hydrogen Ecosystem North Adriatic 2022, 2nd Conference**
- **13.01.2023** - **Evaluation Summary**
- **Current** - **Grant Agreement / Consortium Agreement Preparation phase**
- **23.05.2023** - **Grant Agreement signature**



North Adriatic Hydrogen Valley - Consortium Partners

<p>Territory</p>	<p>SLOVENIA</p> 	<p>CROATIA</p> 	<p>ITALY</p>  <p>Regione autonoma Friuli-Venezia Giulia</p> 
<p>Institutional Partners</p>	<p>Ministry of Infrastructure</p>	<p>Ministry of Economy and Sustainable Development</p>	<p>Regional Council of Friuli-Venezia Giulia</p>
<p>Research Community</p>	<p>University of Ljubljana</p> 	<p>University of Rijeka</p> 	<p>University of Trieste</p> 
<p>Industrial Partners</p>	<p>Holding Slovenske elektrarne d.o.o. Termoelektrarna Šoštanj d.o.o. HSE Invest d.o.o. Ecubes d.o.o. Steklarna Hrastnik d.o.o. Salonit Anhovo d.d.</p> 	<p>ACI Marine Active Solera Dilj Indeloop MCoE Gitone Kvarner d.o.o.</p> 	<p>AREA Science Park ABS /Danieli Centro Combustion Snam S.p.A Ferriere Nord, Pittini Group ACEGAS Faber Industrie</p> 
<p>Partners Outside Territory</p>	<p>Fundación para el Desarrollo de las Nuevas Tecnologías del Hidrógeno en Aragón</p> 		<p>Meta Group Fondazione Bruno Kessler CTS H2</p> 
			<p>TPL FVG</p> 

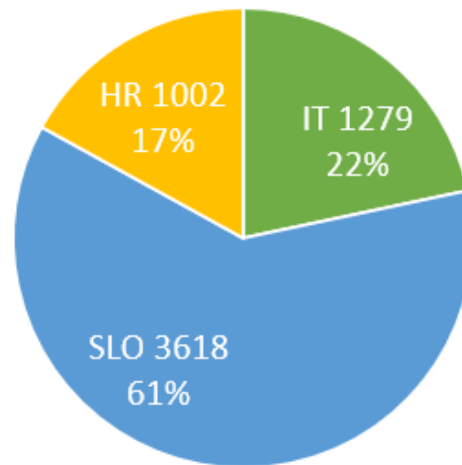
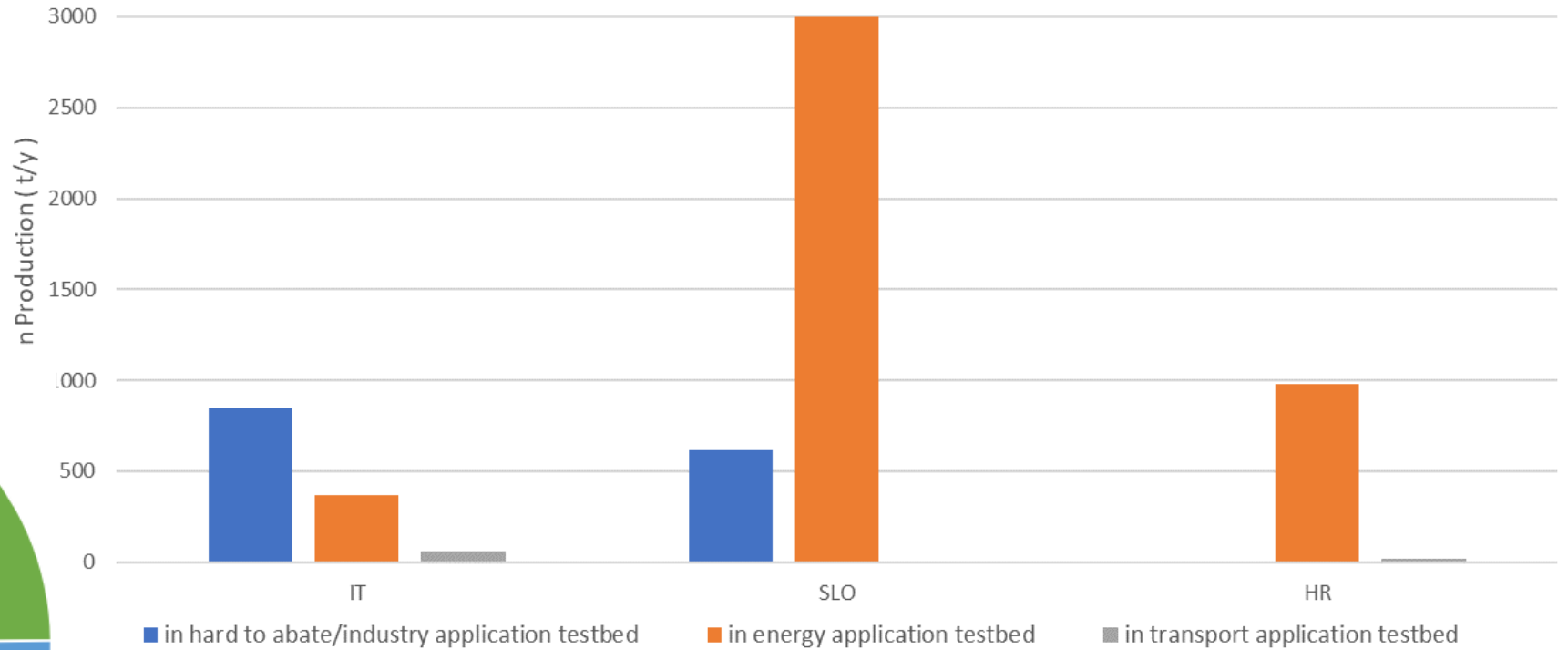
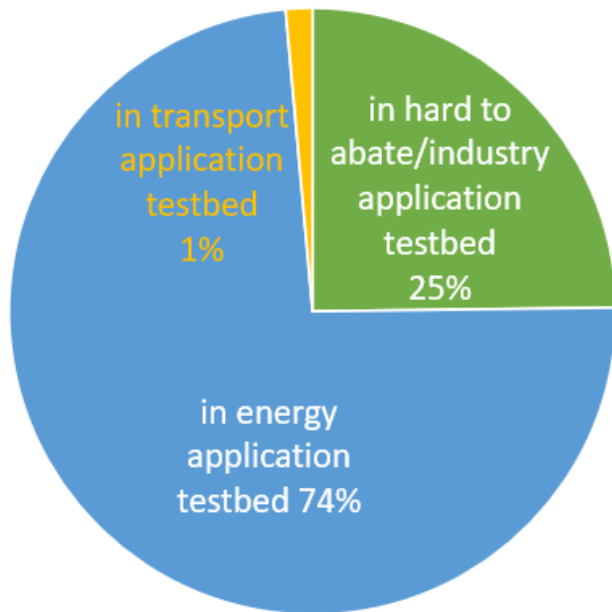
North Adriatic Hydrogen Valley - Territory



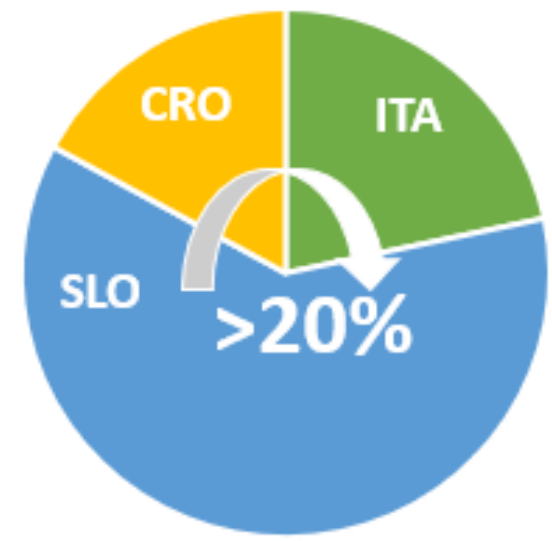
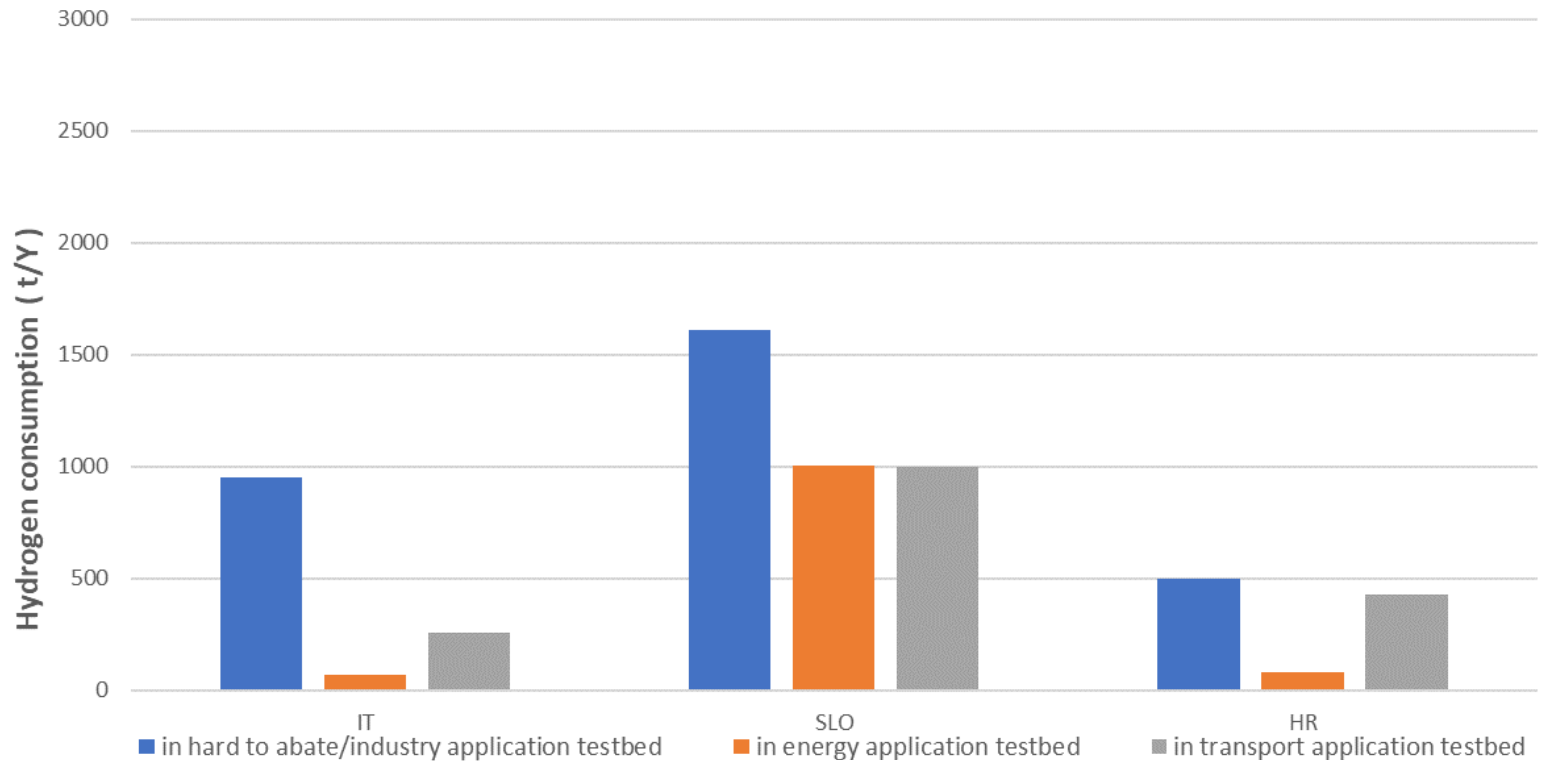
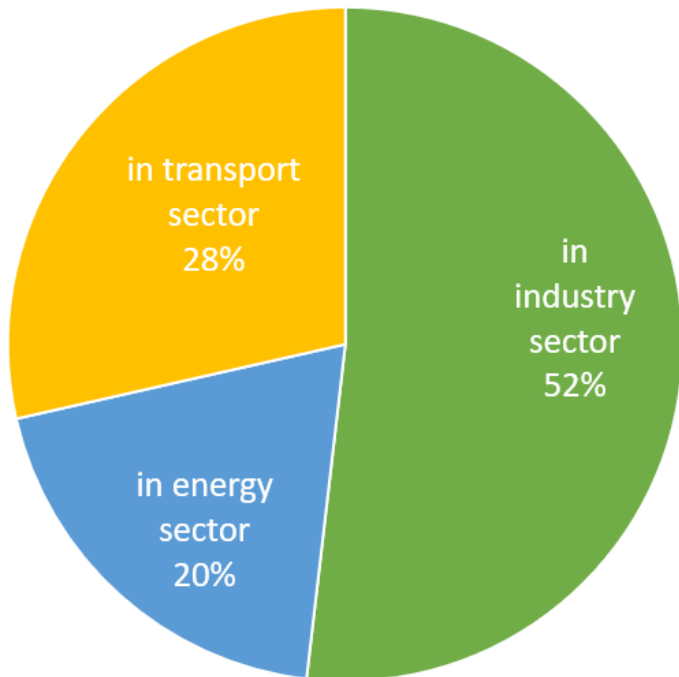
Hydrogen production and consumption

Territory	Company	Supply Chain position	Sector	H2 Production (t/a)	H2 Consumption (t/a)		
					Industry	Energy	Transport
SLOVENIA 	Holding Slovenske elektrarne 	producer/end user/distribution	energy/transport/ grid balance	3.000	1.000	1.000	1.000
	Steklarna Hrastnik 	producer/end user/distribution	hard to abate/ industry	608	608		
	Salonit Anhovo 	end user/ producer	hard to abate/ industry	50	50		
	Ecubes 	Producer/distribution	Energy/transport	50			50
CROATIA 	ACI Marine 	end user/ producer/ distributor	transport	22			22
	Active Solera	producer	energy	900	500		400
	Dilj 	end user	hard to abate/ industry	/			
	Indeloop 	producer	hard to abate/ industry	80			80
	MCoE 	end user	transport	/			
ITALY Regione autonoma Friuli-Venezia Giulia 	Danieli Centro Combustion 	end user	hard to abate/ industry	/			
	SNAM/ Halo Industry SpA 	end user/producer	hard to abate/industry	850	850		
	Ferriere Nord, Pittini Group 	end user/producer	hard to abate/industry	/			
	ACEGAS 	producer/distributor	energy	300	100		200
	CTS H2 	distributor	energy	2			2
	Cimolai 	producer/end user	energy/transport	72		72	
	Faber Industrie 	producer/distributor	energy				
	TPL FVG 	distributor	transport	55			55
TOTAL				5989	3108	1.072	1809





Hydrogen production






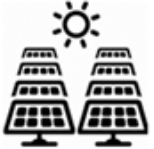
Hydrogen consumption



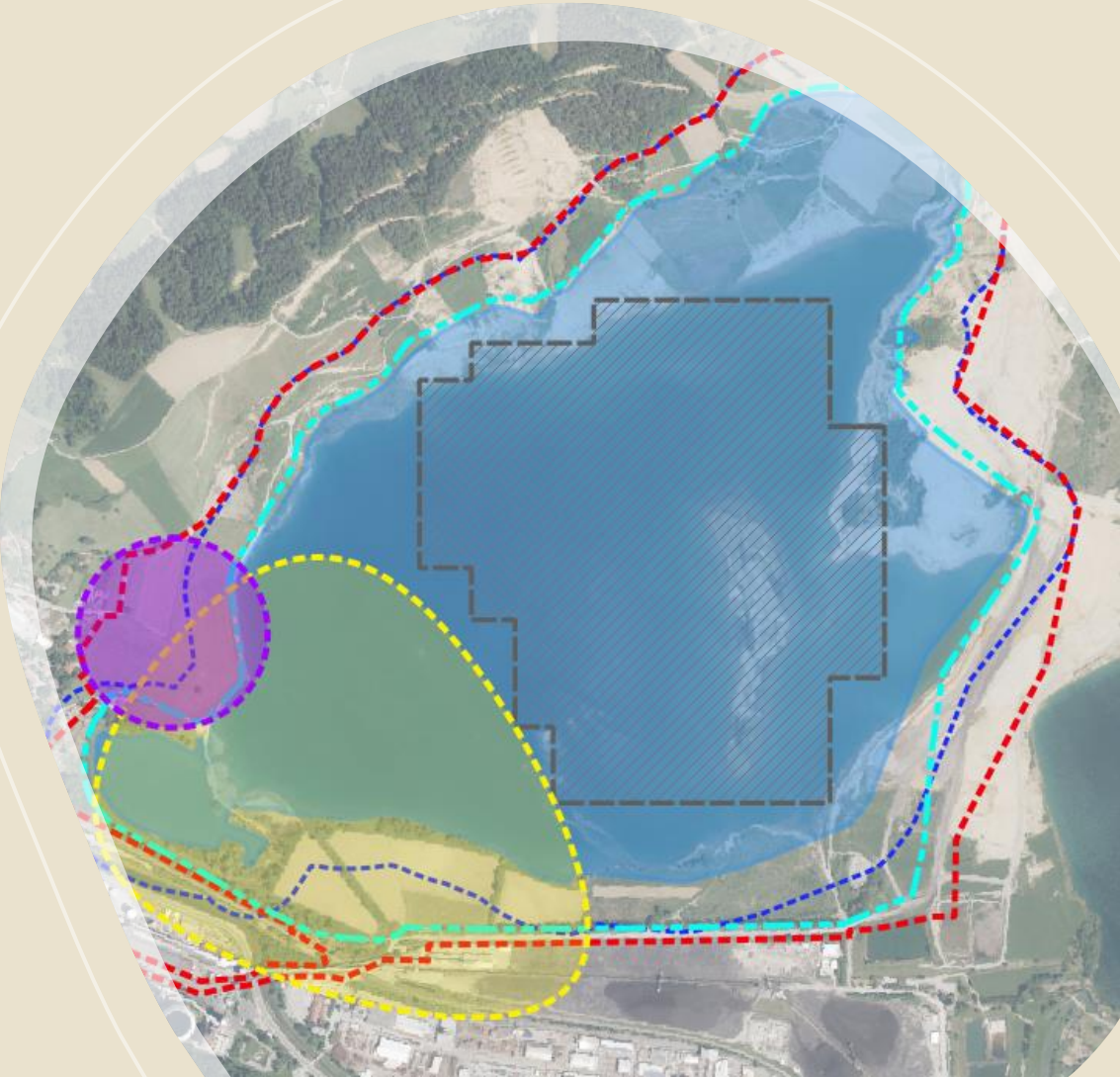
Financial Overview (contribution Clean H2 JU and Institutional partners)

Territory	This Call	National Funds available	Initial investment	Investment at Operational level
SLOVENIA 	7,53 <u>mill</u> €	80 mill € (Cohesion: 44 mill €, RRF 20 mill €, JTF 16 mill €)	175.26 mill €	345.54 mill €
CROATIA 	7,08 <u>mill</u> €	80 mill € (RRF: 59 mill €, ERDF Programme 21 mill €)	38.3 mill €	337.9 mill €
ITALY  Regione autonoma Friuli-Venezia Giulia 	10,18 <u>mill</u> €	43,5 mill € (FVG: 23.5 mill €, Italy: 20 mill €)	36.5 mill €	106.9 mill €
Outside Territory	0,21 mill €	/	/	/
Total	25 mill €	203,5 mill €	246 mill €	790 mill €

North Adriatic Hydrogen Valley - HSE's Project

Location: TEŠ, Šoštanj, Slovenia						
Project stage	H2 type	H2 production capacity	H2 available	H2 storage	HRS	RES source
Current facility on site	grey H2	200 kW, 32 kg/d	20 kg/d, 8 t/a residual H2	48 kg	/	/
1. phase "mini ZEMC-S"	grey H2 / green H2	200 kW, 32 kg/d	20 + 2 kg/d 8 t/a residual H2	48 kg	30 kg/d 1 dispenser	PV: 35 kW
2. phase "ZEMC-S SAŠA"	green H2	500 kW, 213 kg/d	120 kg/d 50 t/a	700 kg	75 kW, 11,7 kg/h 2 dispensers	PV: 4 MWp Hydro PP
3. phase "Industrial scale"	green H2	20 to 30 MW	3.000 t/a	30 t	to be defined	PV: 250 MWp

HSE sources of green hydrogen



Conclusions

- Project NAHV is first cross-border regional hydrogen valley with 34 partners
- GA and CA agreement preparation phase → take into consideration approval process at every partner
- 17 testbeds were selected for the proposal with bottom-up approach
- Institutional partners have a huge role in finding additional funds for NAHV

Thank you !

*„Alle sagten das geht nicht. Dann kam einer, der wusste das nicht und hat es einfach gemacht“
~ Autor unbekannt ~*

[Everyone said it wouldn't work. Then somebody came along who didn't know that, and just did it.]