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POSEIDON MED LNG BUNKERING PROJECT

Co-financed by the European Union
Trans-European Transport Network (TEN-T)

Road and maritime transport: a COMMON STRATEGY!

The port of Venice applies the national guidelines (Italian Transport and Economic Development Ministries) also for 2016-2018 projects that foster the integration of road and maritime transport modes.

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The port of Venice and the EU projects related to LNG

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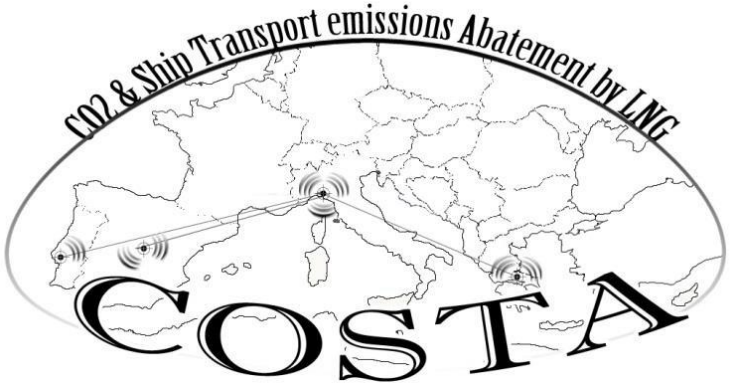

AUTORITÀ PORTUALE
DI VENEZIA

POSEIDON MED II

GAINN_IT initiative

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Poseidon MED project: Venice local LNG assessment criteria

1. LNG demand analysis

1.1 Maritime transport LNG demand

1.2 Road transport demand (direct and hinterland –through LNG distribution to road refueling stations)

1.3 Other uses (port operations, inland transport, others)

1.4 LNG demand aggregation and storage plant plan preliminary sizing (capacity, surface, etc.)

2. Analysis of the LNG supply chain: sources and supply system, storage location preliminary analysis and distribution models to different end–user types

2.1 Analysis of the LNG plant possible sources and of the supply system

2.2 Preliminary localization of the storage plant

2.3 Distribution models to different end–user types

3. Infrastructural and regulatory proposals for LNG supply development in the port

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The port of Venice: a multiservice port

- **Industrial and commercial area – Port of Marghera and San Leonardo**
- **Cruise terminal – Marittima**
- **INW connection to Valdaro-Mantova**

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LNG scenarios assumptions and economic analysis

LNG convenience Scenarios at 2030 – hypothesis on prices

Pessimistic scenario	Intermediate scenario	Optimistic scenario
Relative LNG/crude price: HIGH	**Relative LNG/crude price: INTERMEDIATE (obtained as average between pessimistic and optimistic scenario)**	**Relative LNG/crude price: LOW**
LNG price relative to crude: 0,61	LNG price relative to crude: 0,45	LNG price relative to crude: 0,29
Projection at 2030 of the present day price conditions (May 2015): - crude oil price remains LOW - LNG price in the EU correlated to crude price (it remains at present level)	Projection at 2030 based on INTERMEDIATE relative price: - intermediate increase of crude price - LNG price in the UE weakly correlated with crude price (it does not rise, remains at present levels)	Projection at 2030 based on LOW LNG relative price: - crude price slowly returns at HIGH levels (as one year ago, June 2014) - LNG price in the UE highly decoupled from crude price (-20% reduction on present levels
- crude price: 65 $/boe = 11,2 $ /MBtu - LNG import price in UE: 6,8 $/Mbtu - Spread LNG-oil: 4,4 $/boe	- crude price: (extreme scenarios average): 87,5 $/boe = 15,1 $ /MBtu - LNG import price in the UE: 6,7 $/Mbtu - Spread LNG-oil: 8,3 $/boe	- crude price: 110 $/boe = 19,0 $ /MBtu (June 2014) - LNG import price in UE: 5,4 $/Mbtu - Spread LNG-oil: 13,5 $/boe

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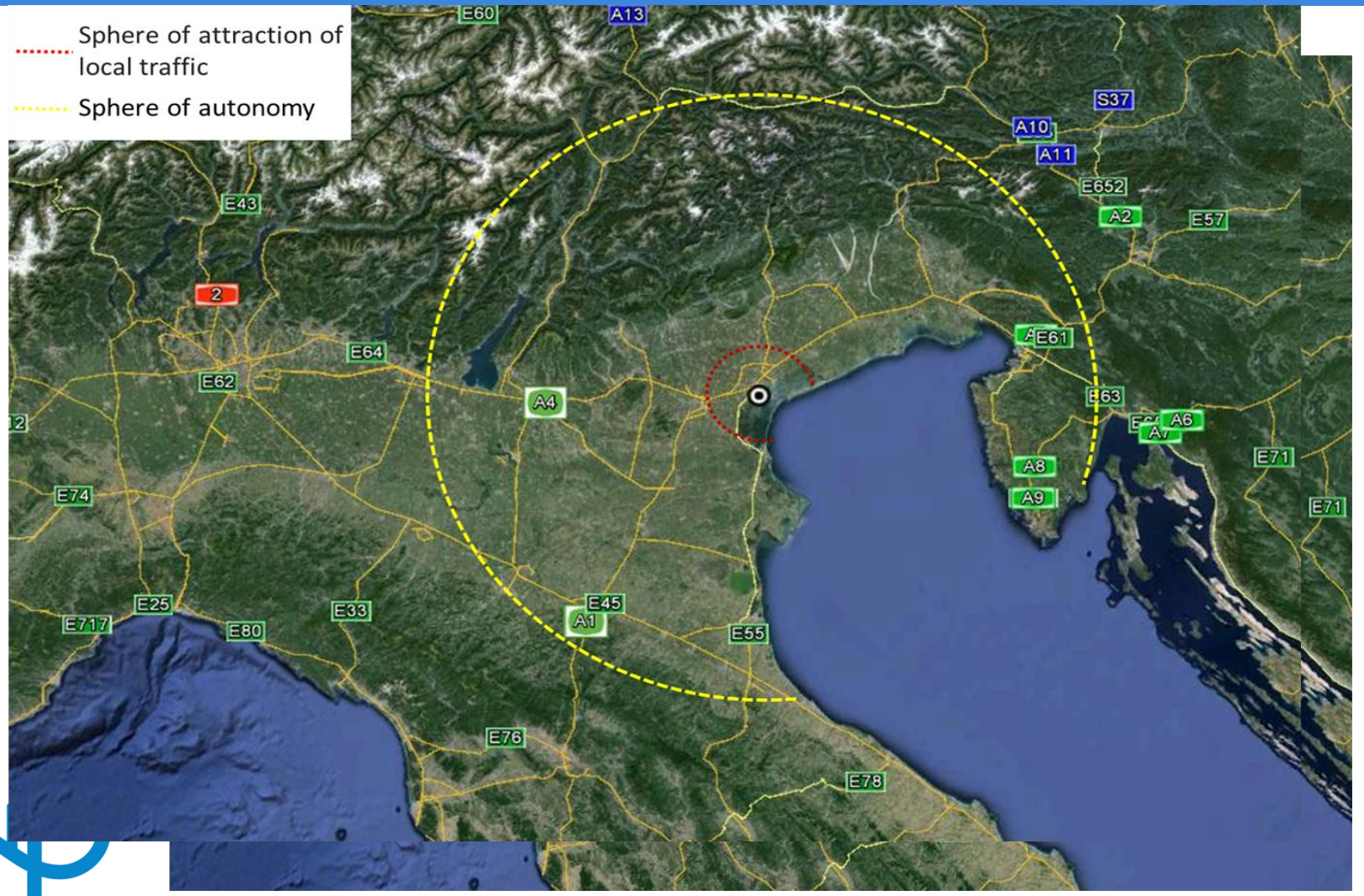
The PORT of VENICE – Evaluation model for local traffic fuel autonomy



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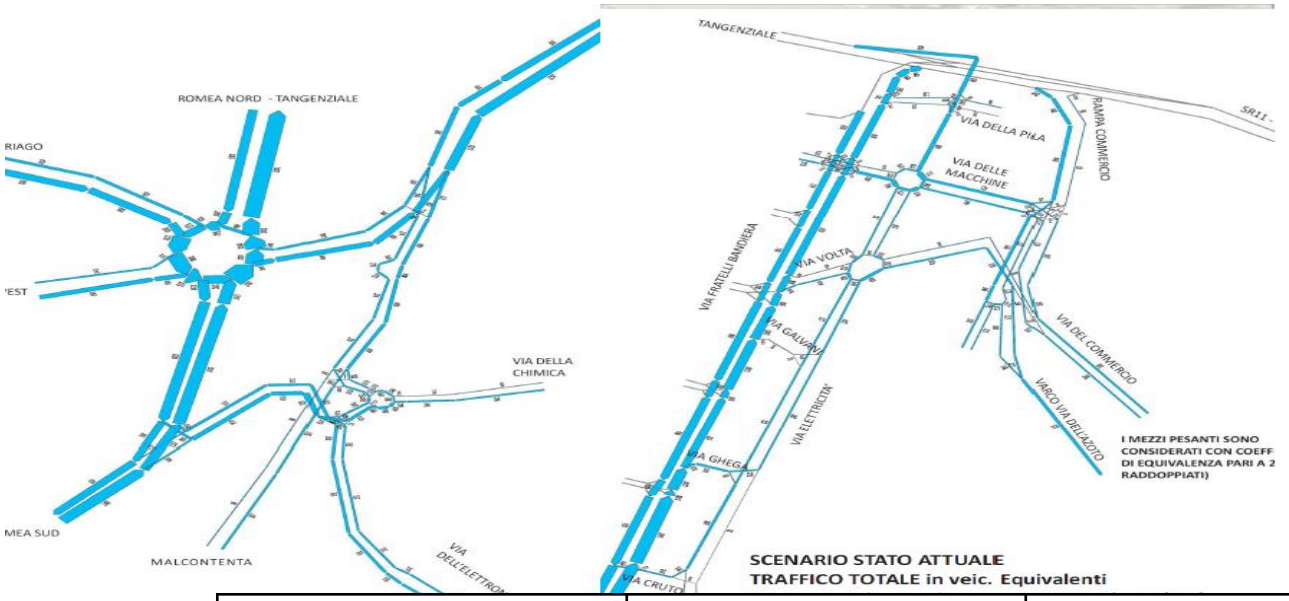
PORT OF VENICE: traffic flows analysis to estimate fuel consumtion



Port of Marghera : estimation of heavy vehicles traffic (transits)

Sourse: ECBA project on VPA data

	% heavy vehicles	Daily traffic	Yearly traffic
Via dell'elettronica (Ro Ro terminal)	69%	849	254.589
Via del Commercio (container terminal)	70%	851	255192
Via della Chimica	14%	45	13.377
Total		1.744	523.158

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Water Transport LNG demand – ship fuel consumption (maritime transport, lagoon boats, inland waterways)

Criteria adopted in allocation of ships fuel consumptions to Venice port

- **Spot traffic**: fuel consumptions of all ships leaving from Venice on the voyage to the arrival port (departing voyage criteria).
- **Liner traffic**: lines departing from Venice have been selected and the whole circular line ship's fuel consumptions have been arithmetically divided by the expected number of ports with LNG supply facilities (Venice share of circular line consumptions criteria).
- **All ships in port**: ships fuel consumptions in Venice port have been entirely allocated to Venice market.

Venice Port Ship categories	Liner traffic	Allocation Criteria
Chemical Tankship	NO	Departing Voyage (from Venice to the arrival Port)
Oil tankship	NO	Departing Voyage (from Venice to the arrival Port)
Other tankship	NO	Departing Voyage (from Venice to the arrival Port)
Gas carrier	NO	Departing Voyage (from Venice to the arrival Port)
Bulkcarrier	NO	Departing Voyage (from Venice to the arrival Port)
Containership	YES	Venice share on circular line
General dry cargo ship	NO	Departing Voyage (from Venice to the arrival Port)
Heavy load carrier	NO	Departing Voyage (from Venice to the arrival Port)
Ro Ro cargo	YES	Venice share on circular line
Barge	NO	Departing Voyage (from Venice to the arrival Port)
Tug boat	NO	Departing Voyage (from Venice to the arrival Port)
Other types of ships	NO	Departing Voyage (from Venice to the arrival Port)
Ro Ro passenger	YES	Venice share on circular line
Passenger ship	YES (Cruise lines)	Venice share on circular line
High speed passenger craft	YES (lines to Istria)	Venice share on circular line
Dynamically supported craft	YES (lines to istria)	Venice share on circular line
Yacht charter class	NO	Departing Voyage (from Venice to the arrival Port)
Yacht pleasure class	NO	Departing Voyage (from Venice to the arrival Port)

Source: ECBA Project (2015)

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Water Transport LNG demand – ship fuel consumption (maritime transport, lagoon boats, inland waterways)

Ships fuel consumptions have been calculated starting from the Venice port's ship movements data base for year 2014, provided by VPA, which details all arrivals and departure of ships in the Venice port during a whole year, specifying the origin and destination of ships as well.

In addition to this information, all main regular lines departing from Venice port have been reconstructed for the 4 ship categories concerned (cruise, container-ships, Ro Ro and high speed passenger services).

This table resumes the main quantitative data of the sources used for analysis, highlighting the Sea areas concerned by Venice port traffic (Maritime Hinterland).

Venice Port's maritime traffic: main data used and hinterland description

Ship Categories	Departures	Number of ships	Number of lines	Venice Port maritime hinterland
Containership	665	72	15	Central & Eastern Mediterranean, Black Sea
General dry cargo ship	588	370		Mediterranean, North Sea, Arabian Sea
Passenger/cruise ship	579	81	9	Adriatic and Mediterranean
Tankers (chemical tankship, Oil tankship and other Tankship)	468	158		Mediterranean, North Sea, Black Sea, North Atlantic
High speed and Dinamically supported craft	327	6	14	Northern Adriatic
Bulk carrier	315	224		Mediterranen, Black Sea
Ro Ro	287	18	4	Adriatic and Eastern Mediterranean
Yacht charter class & Pleasure craft	160	129		Mediterranen Sea
Gas carrier	134	10		Adratic and Ionian Sea
Barge	89	10		Adriatic
Tug boat	40	15		Adriatic and Black Sea
Other types of ships	27	8		Adriatic
Heavy load carrier	7	6		Adriatic, Arabian Gulf, Black Sea, Gulf of Mexico
Total	3.686	1.107	42	42

Source: ECBA Project (2015), based on data by VPA , line services companies and other sources.

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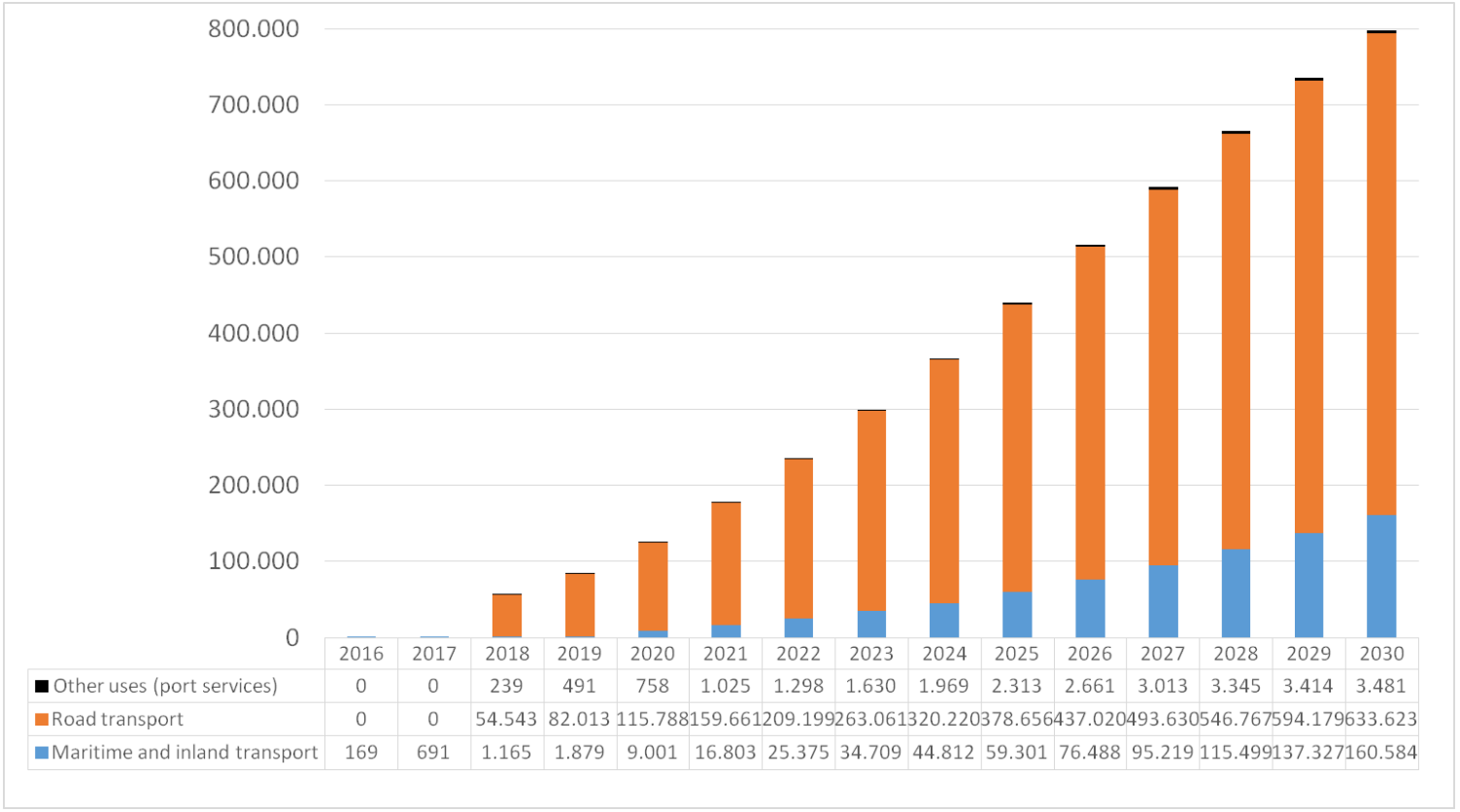
PORT OF VENICE – LNG demand period 2016-2030, intermediate scenario (maritime, road, other uses)



	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Other uses (port services)	0	0	239	491	758	1.025	1.298	1.630	1.969	2.313	2.661	3.013	3.345	3.414	3.481
Road transport	0	0	54.543	82.013	115.788	159.661	209.199	263.061	320.220	378.656	437.020	493.630	546.767	594.179	633.623
Maritime and inland transport	169	691	1.165	1.879	9.001	16.803	25.375	34.709	44.812	59.301	76.488	95.219	115.499	137.327	160.584

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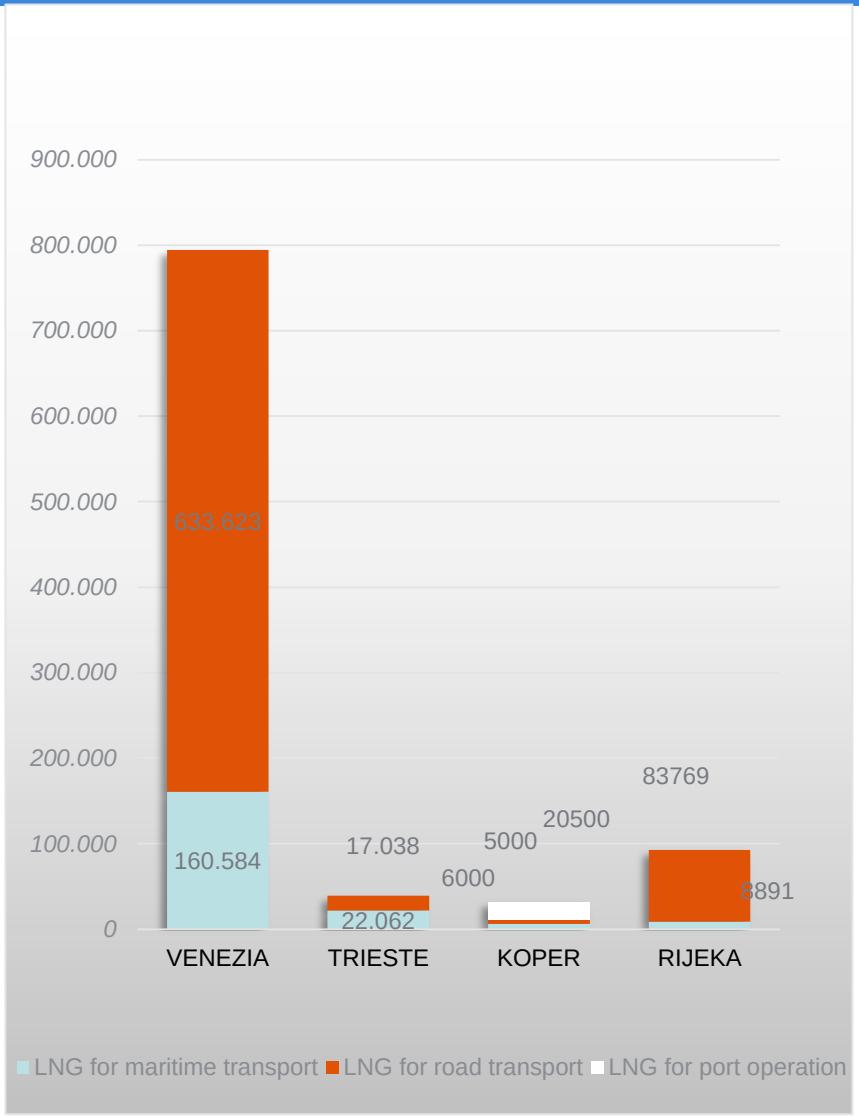
Analysis on the estimated consumption of LNG in NAPA ports



Summary of results for the overall study realized by VPA

Expected consumption for LNG as for 2030

Source: Venice Port Authority, ECBA 2015C

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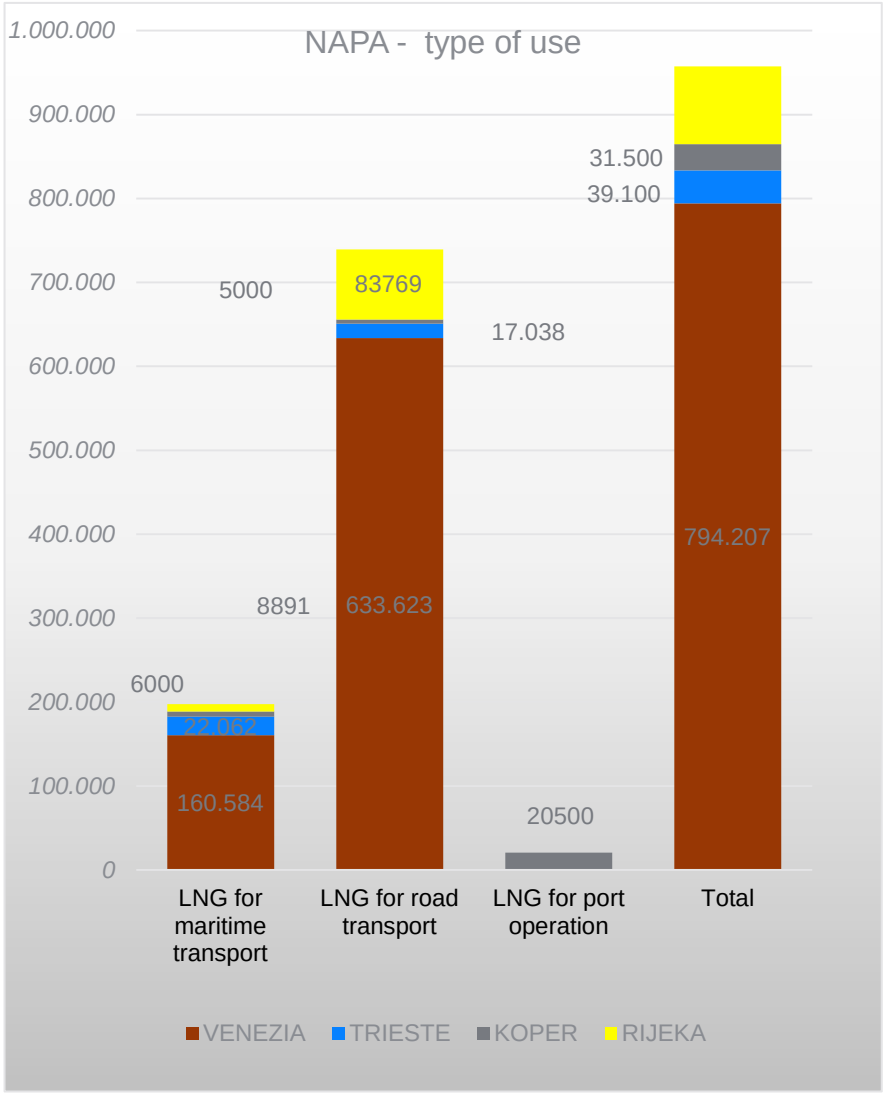
Analysis on the estimated consumption of LNG in NAPA ports



Summary of results for the overall study realized by VPA

Expected consumption for LNG as for 2030

Source: Venice Port Authority, ECBA 2015C

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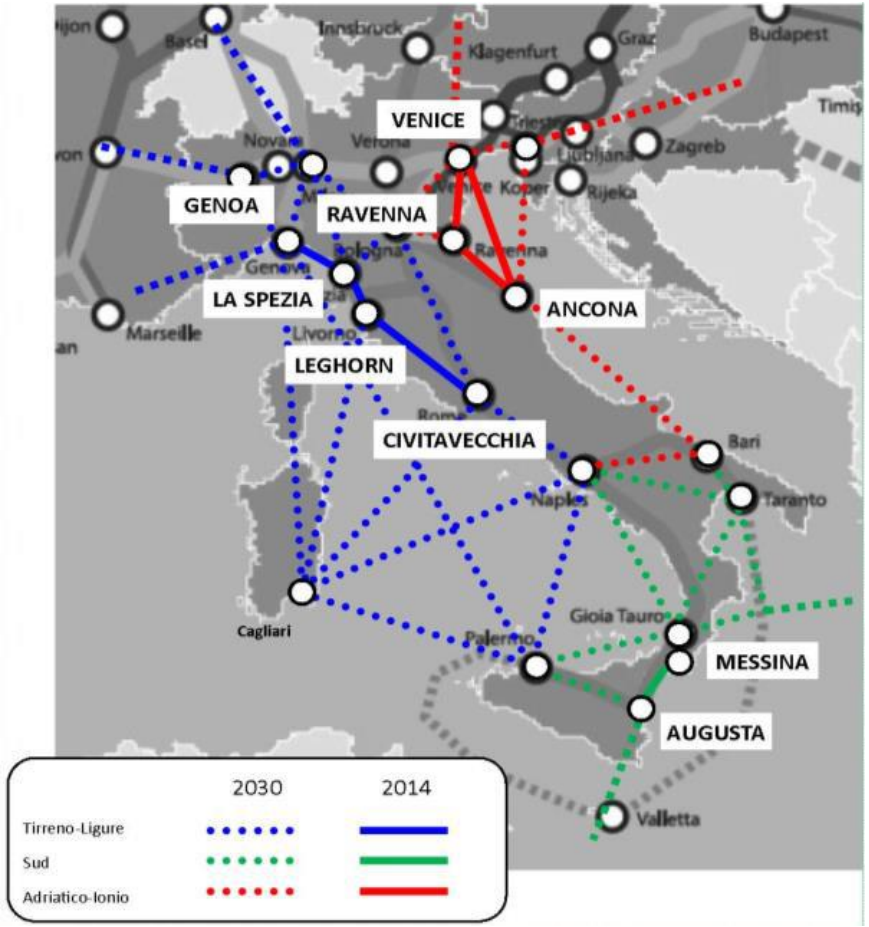
CONCLUSIONS

The port of Venice candidated as LNG receving and distributing hub:

- The geographical position of Venice;
- The estimation of LNG demand up to 2030;
- The infrastructures already existing;
- In line with the national programme;
- Action already planned;



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Thank you!

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