7TH BLACK SEA PORTS & SHIPPING 2018

International Hotel Casino & Tower Suites, Varna, Bulgaria
21st - 23rd May 2018

One Belt – One Road Initiative as an Opportunity for Integration of Renewable Energy Sources in Sustainable Transport & Logistic Solutions – The Case of Constanta Port

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Black Sea Universities Network

Black Sea Universities Network

- **Aim:** The Network was founded for the purpose of developing scientific, cultural and educational cooperation and exchanges among the Universities of the Black Sea Economic Cooperation Participating States and other institutions with similar concern for the sustainable development of the BSR
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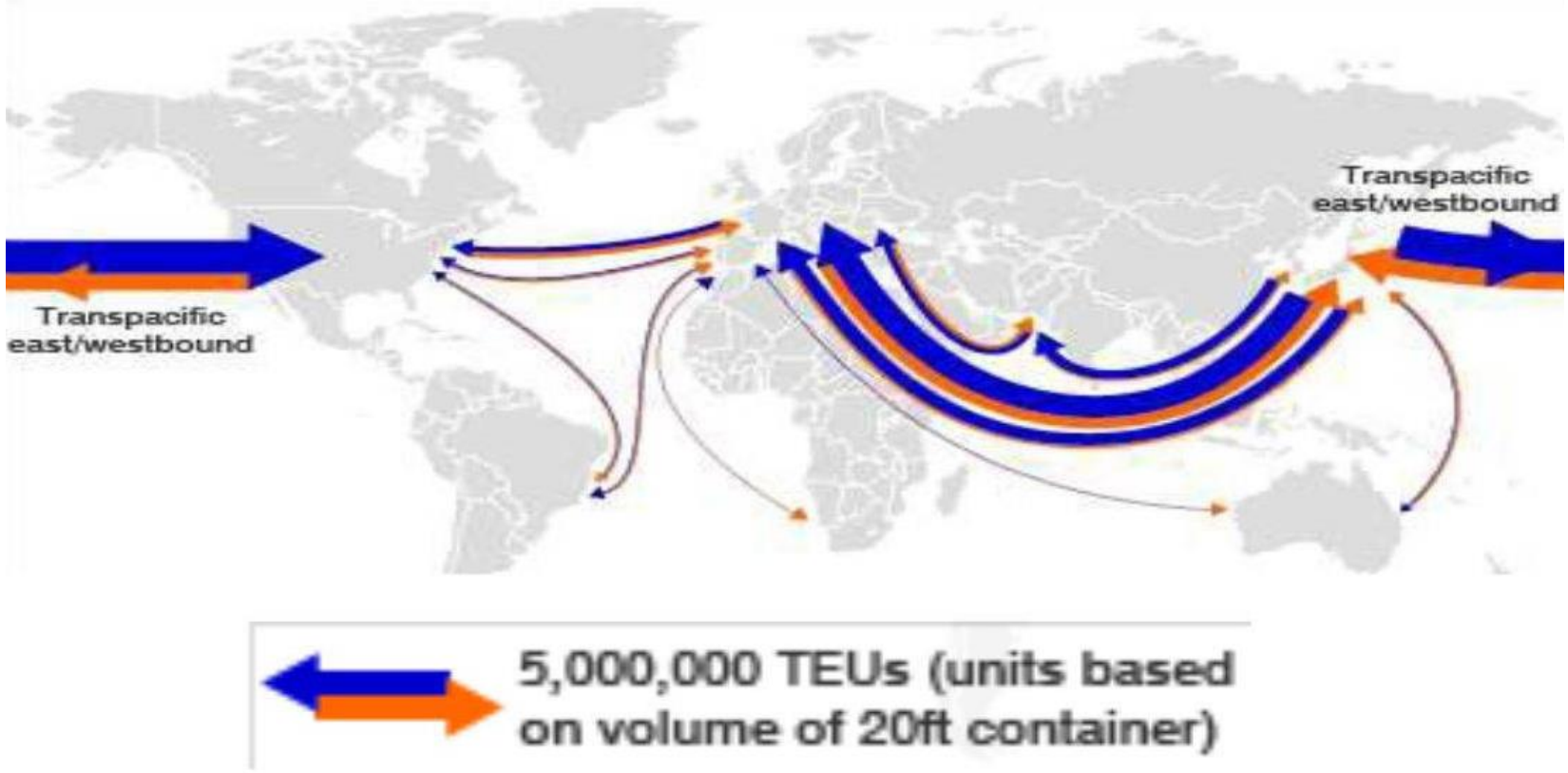
- **Web site:** Http://www.bsun.org

Outline

1. **Current status of perspectives in transport**
2. **Environmental impact**
3. **Renewable Energy Potential**
4. **Concept analysis**
5. **Conclusions**

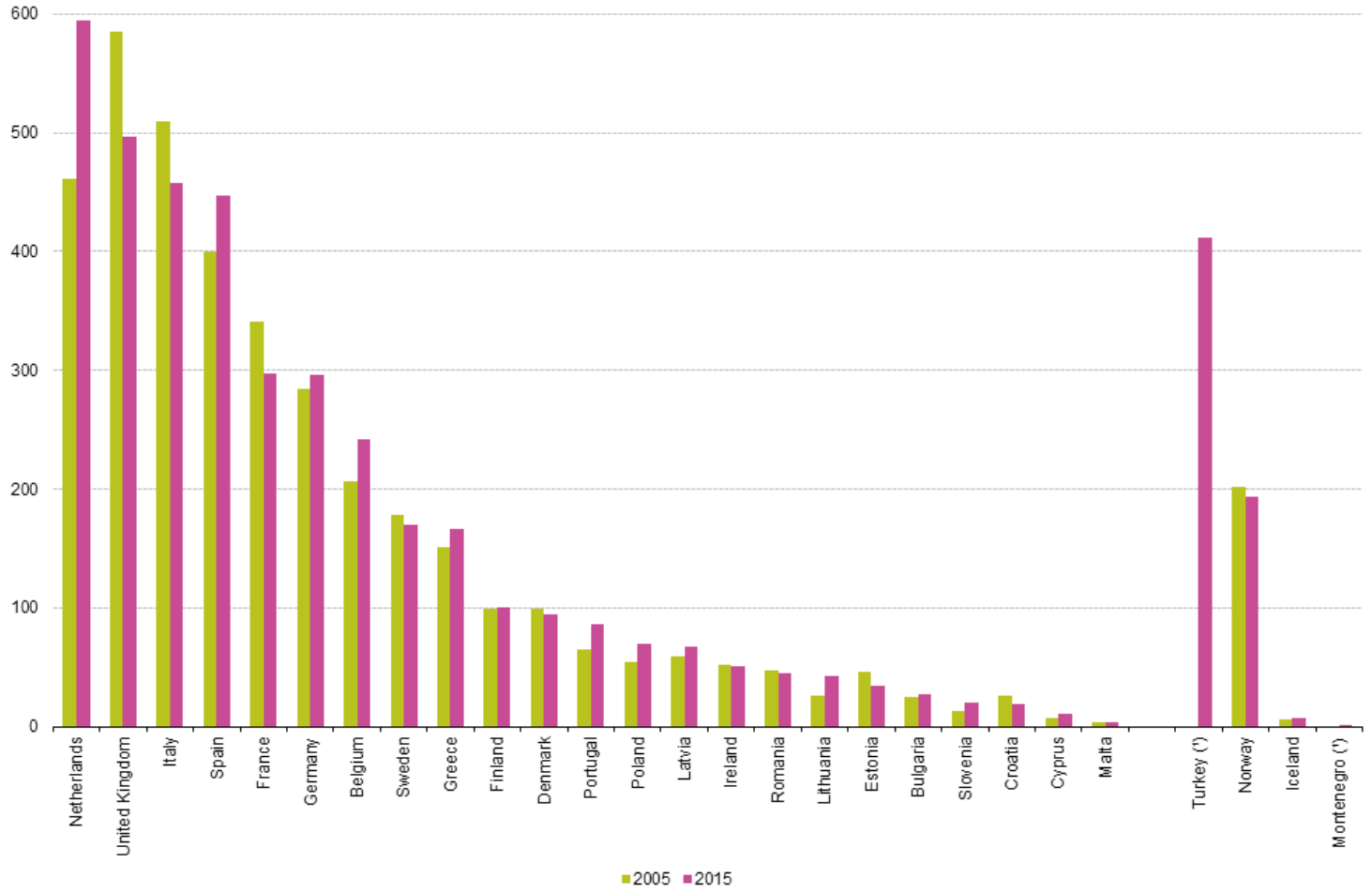
WORLD TRANSPORT ON SEA



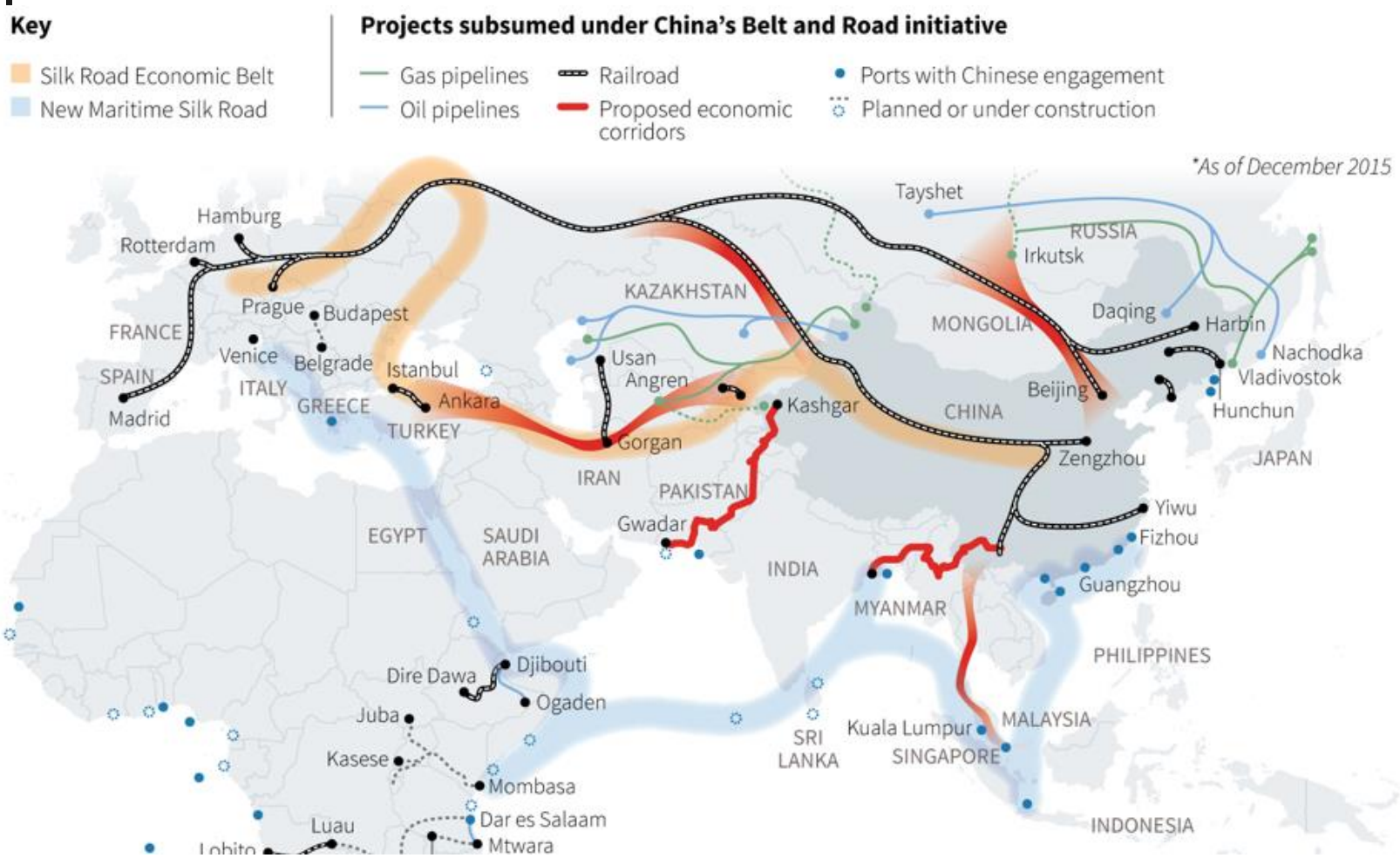
John Vicerman 2011

Source: Containerization International and MDS Transmodal

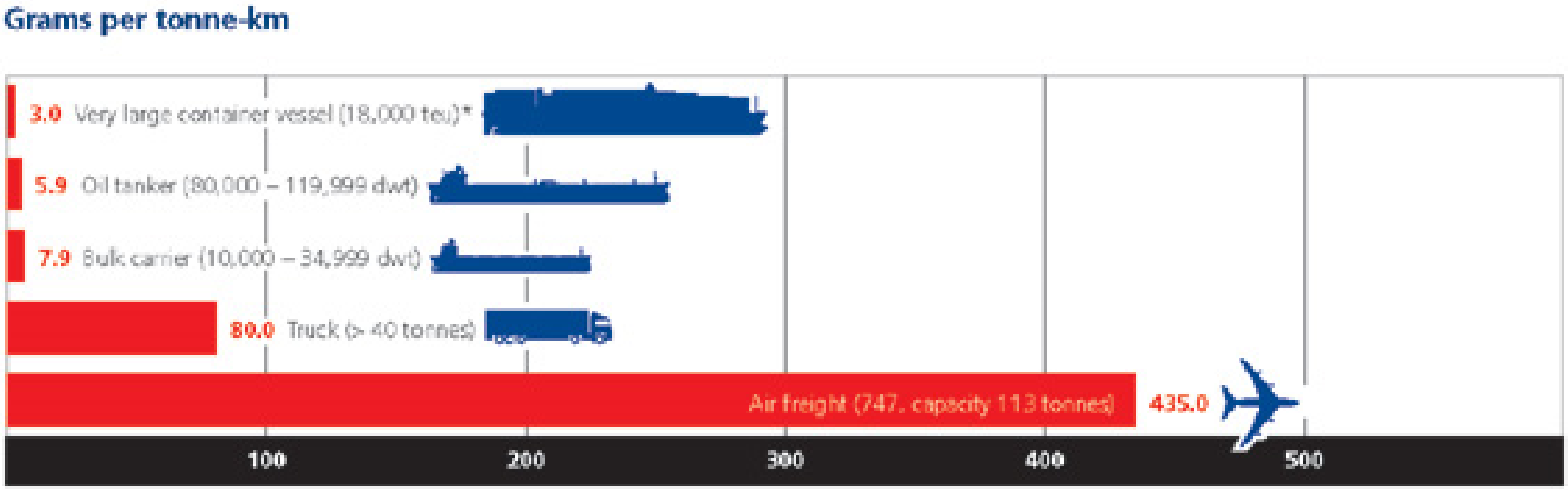
SEABORN TRANSPORT IN THE EU



ONE BELT ONE ROAD Initiative

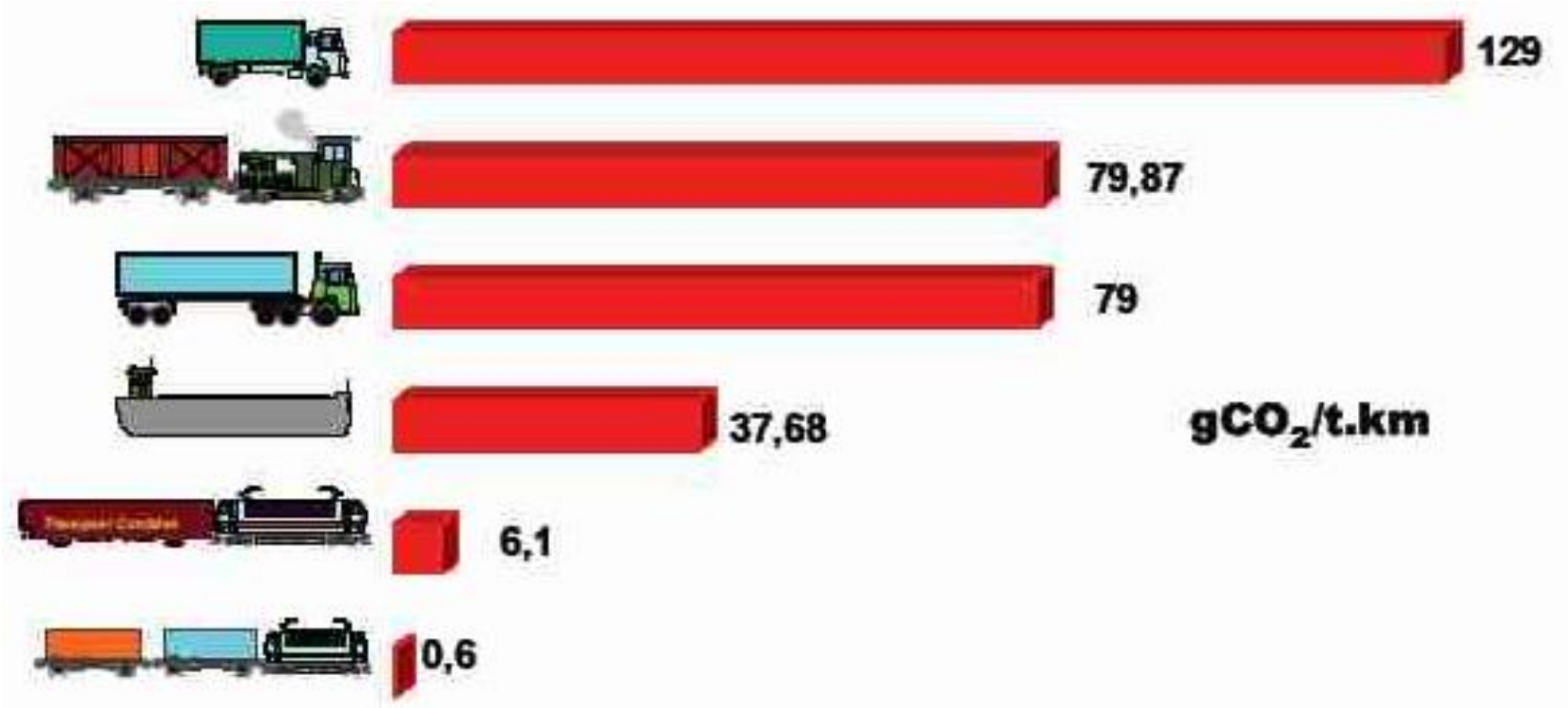


ENVIRONMENTAL IMPACT



*Source: IMO GHG Study, 2009 (*AP Møller-Mærsk, 2014)*

ENVIRONMENTAL IMPACT



TRANSPORT POLLUTION

- **Structural pollution**
- **Operational pollution**
- **Accidental pollution**

OPERATIONAL POLLUTION

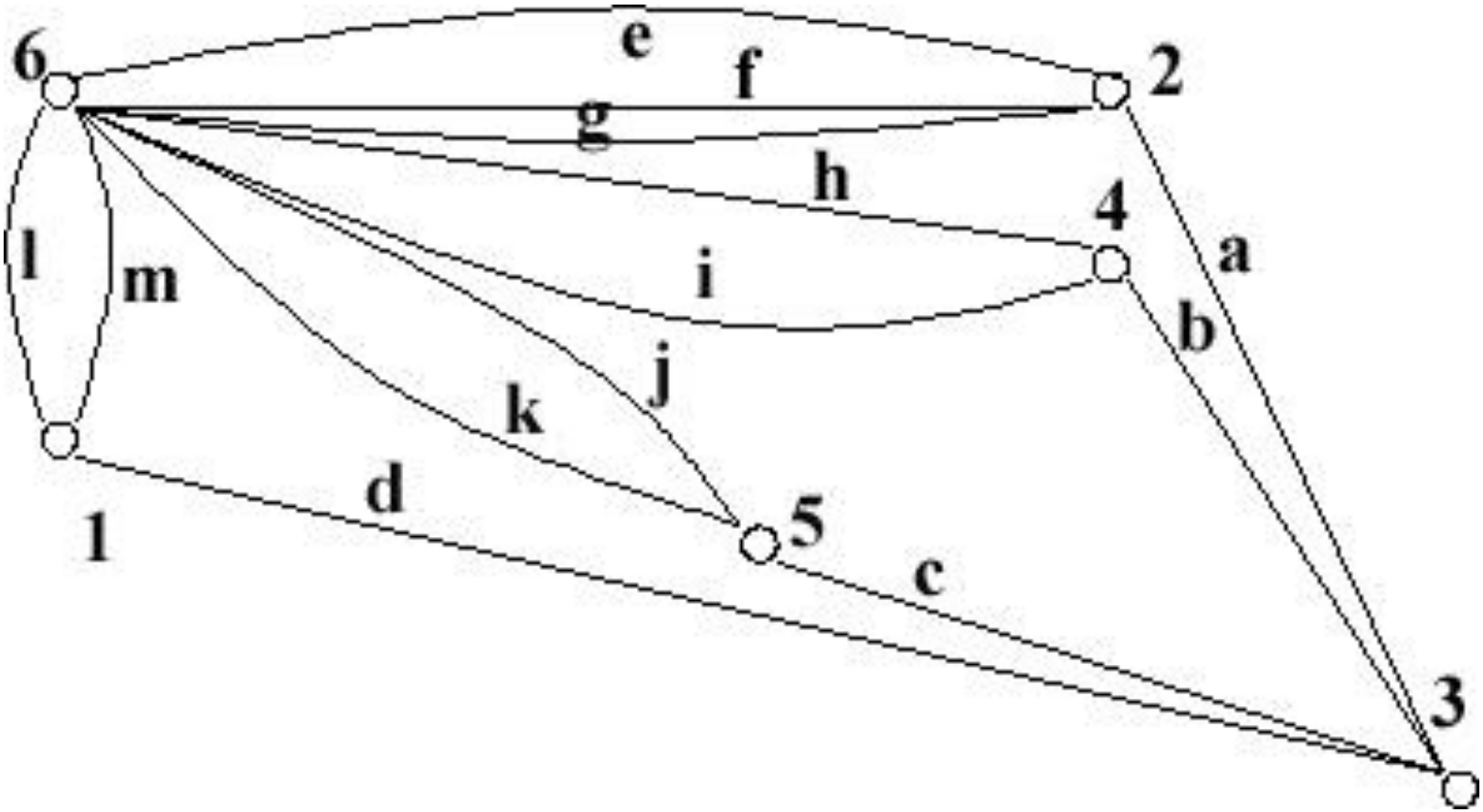
Pollutant	*Trucks*	*Trains*	*Vessels*
CO	0.24..2,4	0.02..0.15	0.018..0.20
CO_2	127...451	41..102	30...40
HC	0.3...1,57	0.01...0.07	0.04...0.08
NO_x	1.85...5.65	0.2...1.01	0.26...0.58
SO_2	0.10...0.43	0.07...0.18	0.02..0.05
Particles	0.04..0.90	0.01..0.08	0.02..0.04

Atmospheric pollution in g/t/km

CONNECTIVITY GRAPH I

Reference Port	Alternative Port	Distances (km)
Port Said	Constantza	1778
	Varna	1630
	Piraeus	1098
	Trieste	2396

CONNECTIVITY GRAPH II



CONNECTIVITY GRAPH III

1. By road: Constantza - Fetesti - Bucuresti - Pitesti - Rm.Valcea - Sibiu - Cluj - Oradea - Berettjoujfalu - Szolnok - Budapesta - Gyor - Viena - Linz - Wels - Muenchen D = 1765 km

2. By railway: Constantza - Curtici - Budapesta - Viena - Salzburg - Muenchen D = 1782 km

3. By sea + by road: Constantza - Cernavoda - Regensburg (water way) 2143 km Regensburg - Muenchen (road) 120 km

EQUIVALENT CO_2 INDEX

Transportation mode / Route	motorway	railway	waterway
Port Said-Constantza			1120
Port Said-Varna			1027
Port Said-Piraeus			691
Port Said-Trieste			1509
Constantza-Muenchen	15355	2370	2320
Varna-Muenchen	14668	2439	
Piraeus-Muenchen	18560	3146	
Trieste-Muenchen	4132	1572	

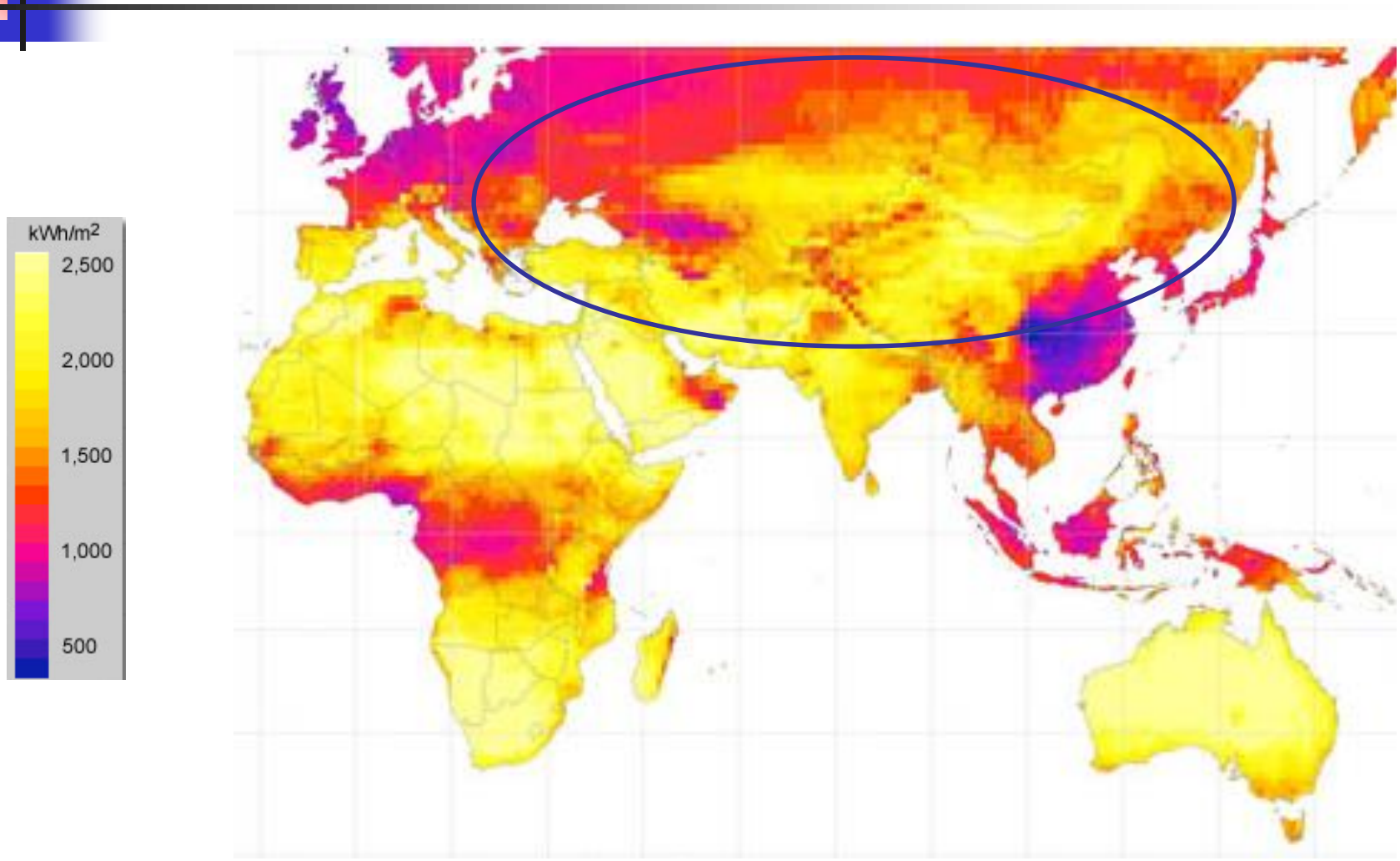
RESULTS

1. **The critical path from the economical perspective is Port Said – Trieste (by sea); Trieste – Muenchen (by railway), the costs being of 900 euro.**

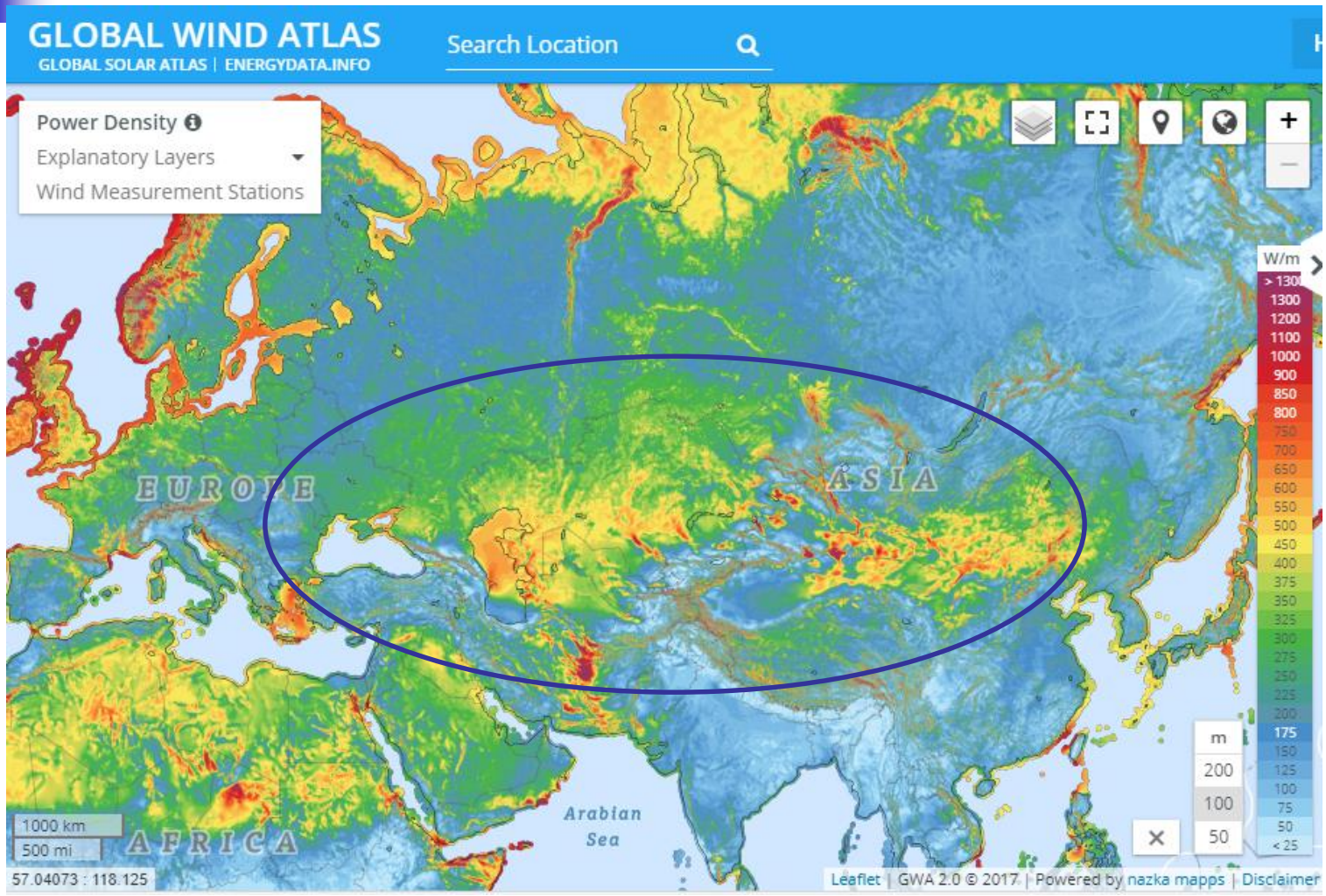
2. **The minimal time options are Port Said – Piraeus (by sea); Piraeus – Muenchen (by road) and Port Said – Trieste (by sea); Trieste – Muenchen (by road), both lasting 7 days.**

3. **The option for ecological impact perspective is Port Said – Constantza (by sea); Constantza – Muenchen (waterway + motorways).**

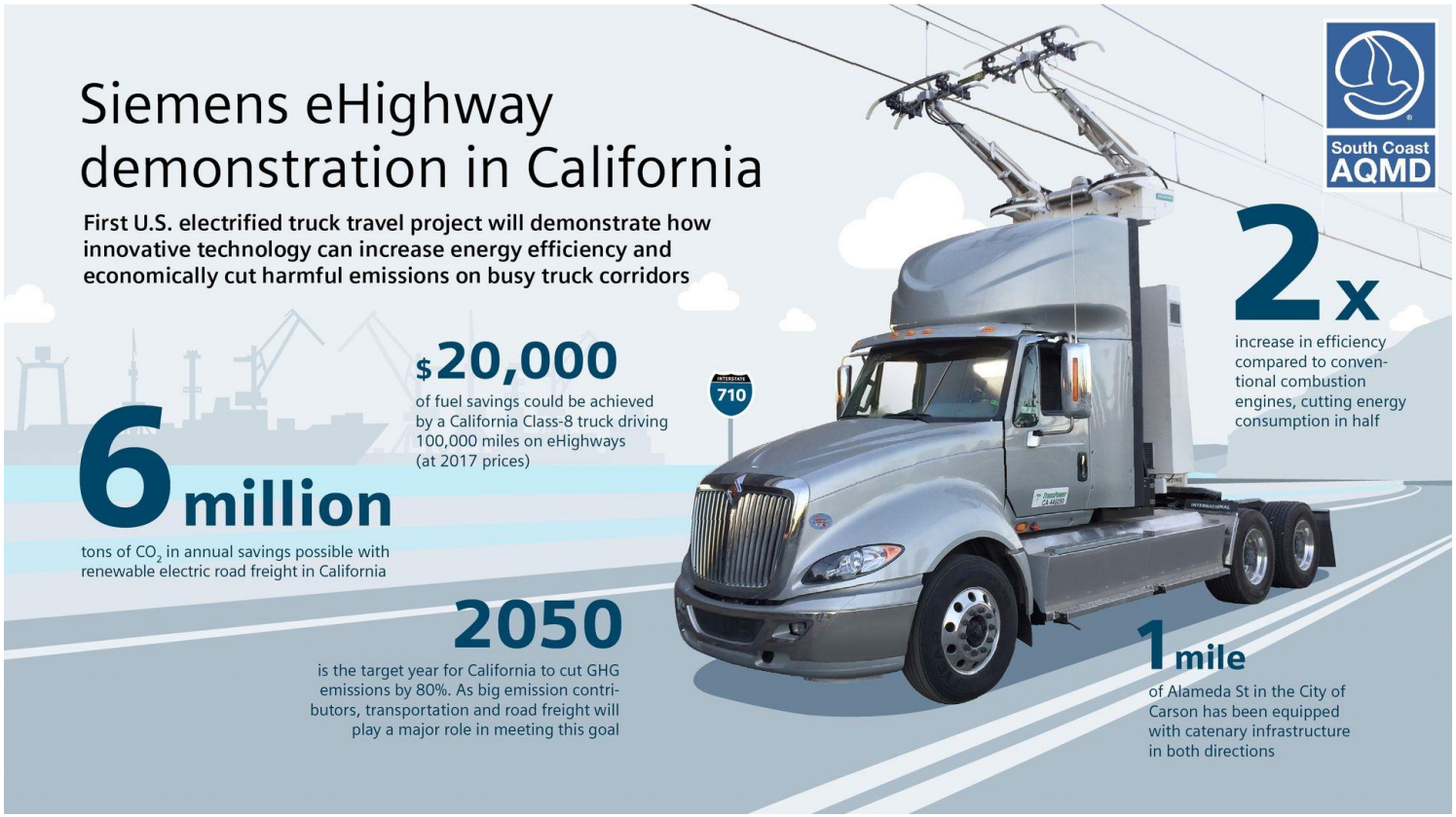
SOLAR ENERGY POTENTIAL



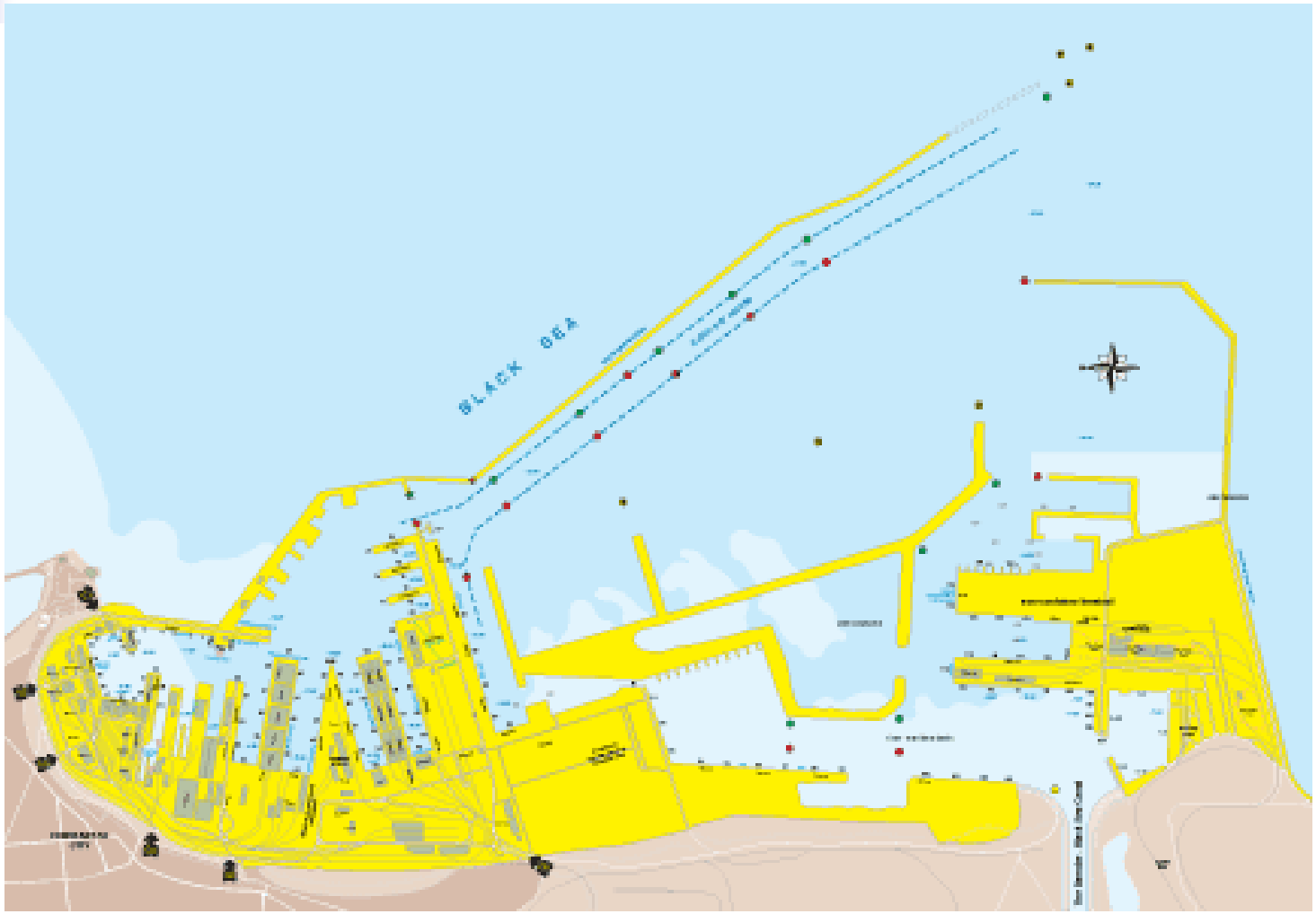
SOLAR ENERGY POTENTIAL



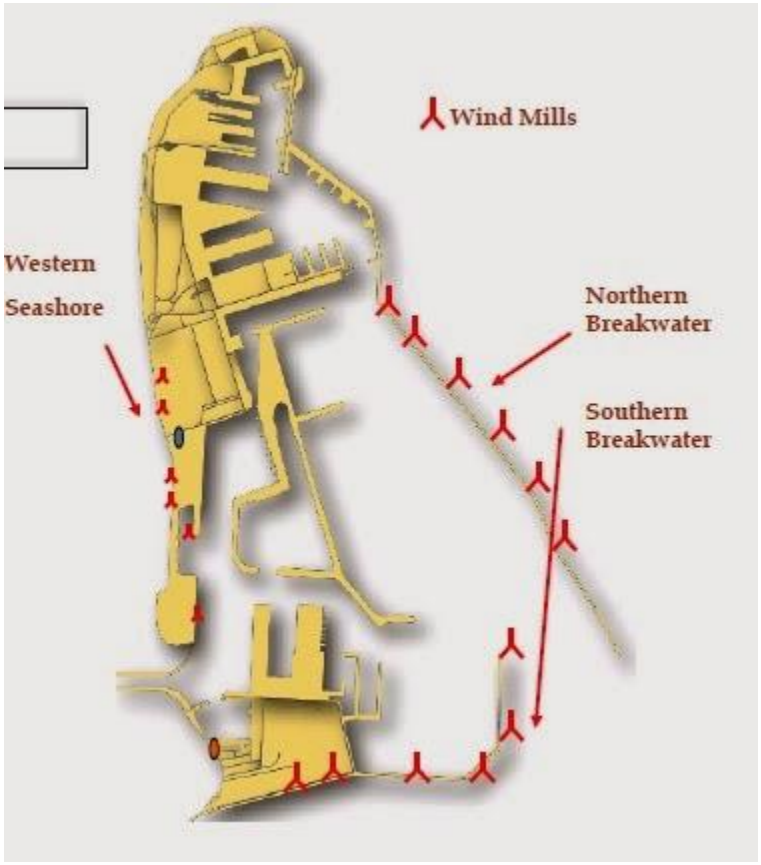
ELECTRIFICATION

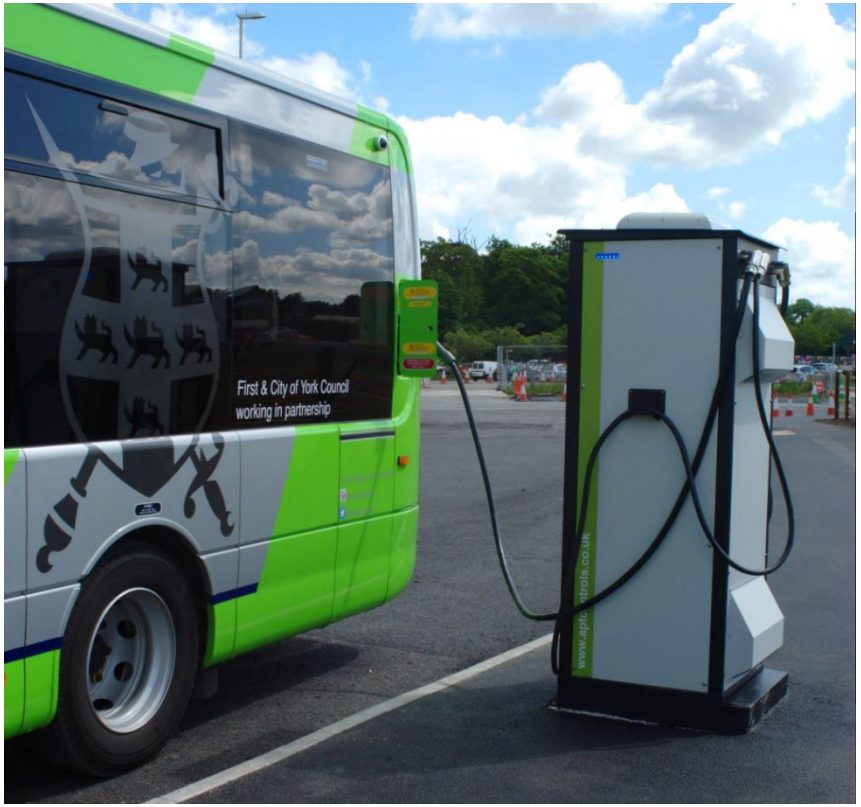


CONSTANTZA PORT



CONSTANTZA PORT





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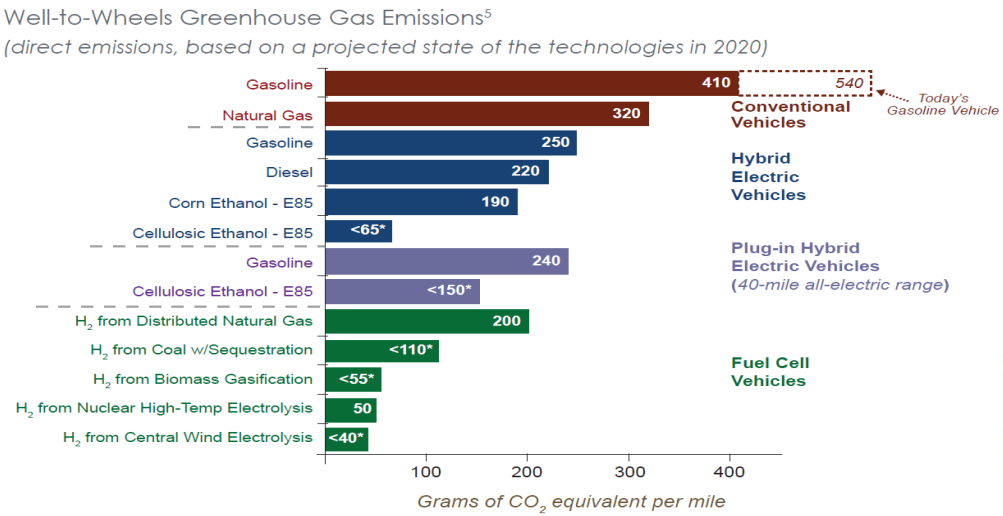
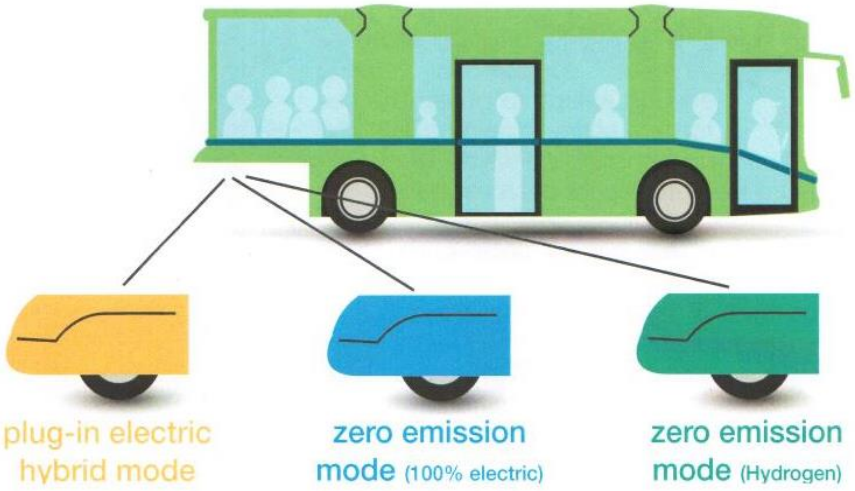


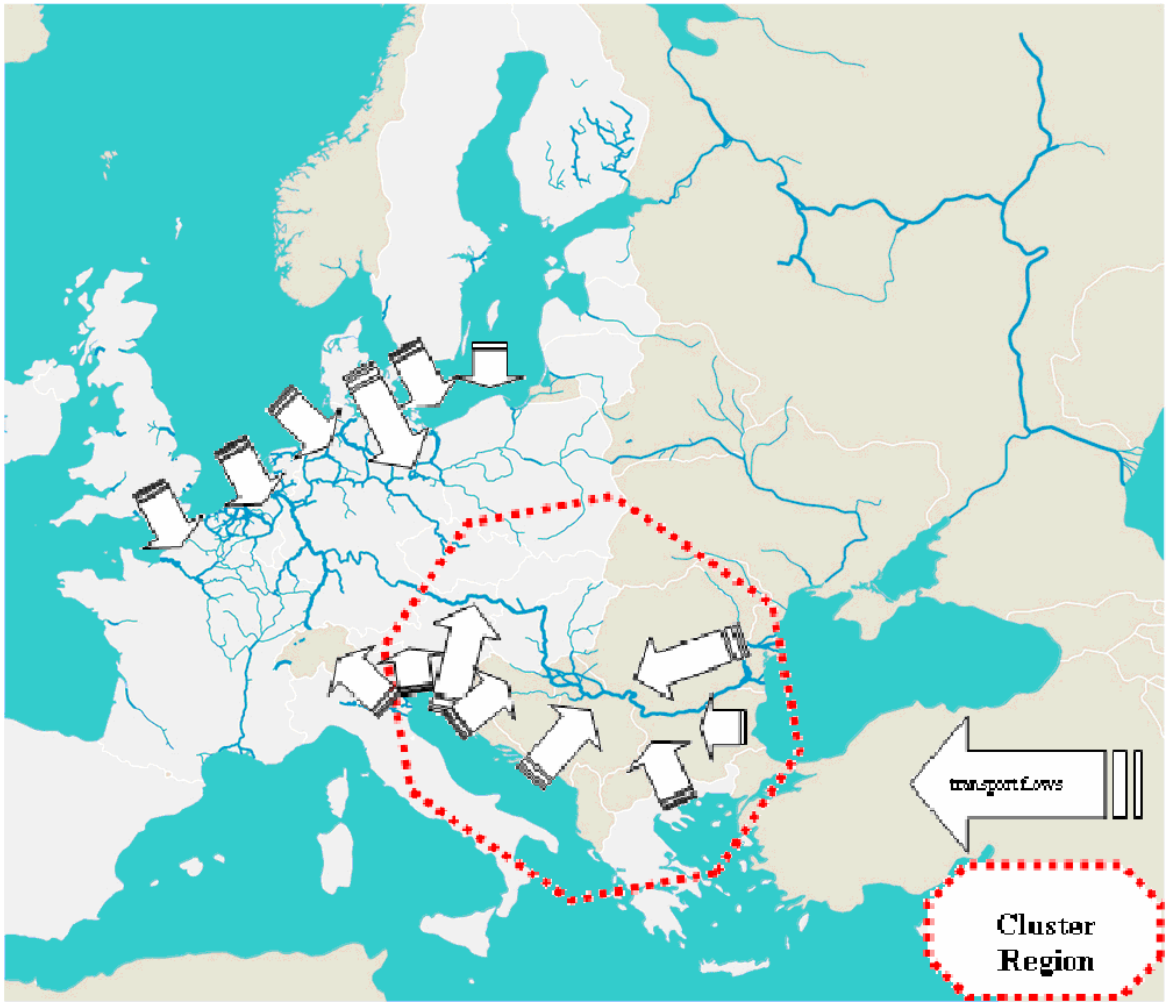


BLACK SEA TRANSPORT CONNECTIONS

AND THE SITUATION OF SEE

THE VALUE OF DANUBE RIVER

PERSPECTIVES ON TRANSPORT FLOWS



A CORRIDOR FOR GROWTH

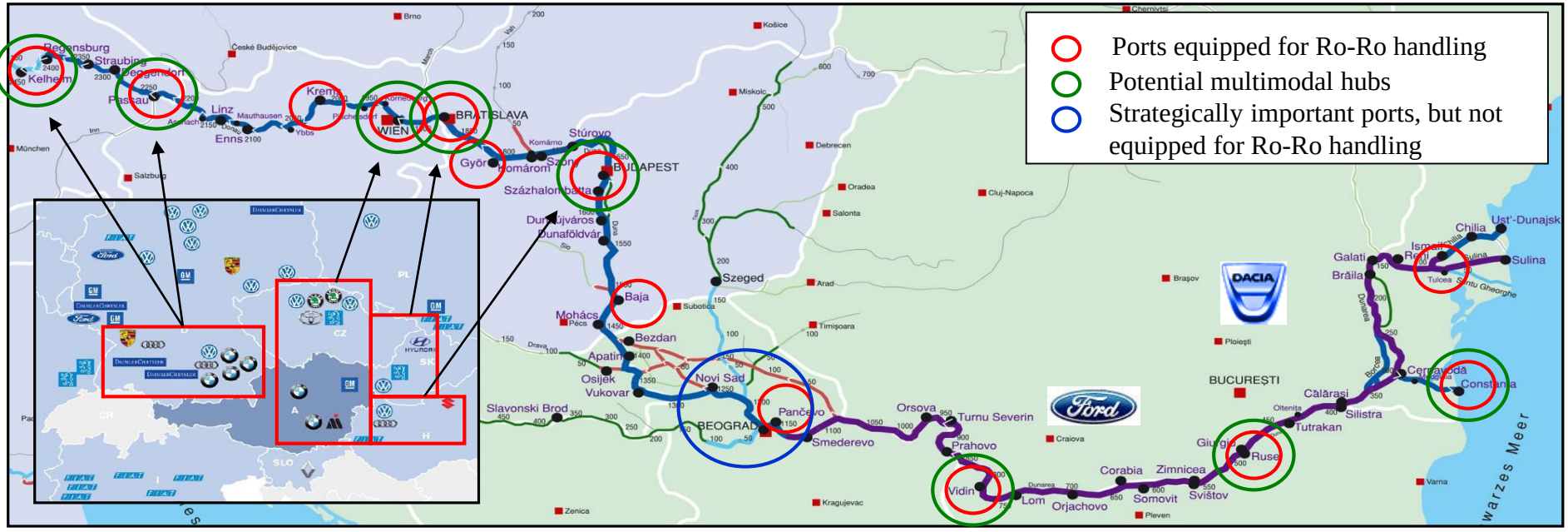


Figure above shows position of auto industries and their potential multimodal hubs in the Danube region that could be relevant for the development of an intermodal transport on the Danube.

CONCLUSIONS

- **OBOR is a very important initiative that could facilitate the access of a significant group of developing countries to infrastructure, investment opportunities and many other benefits.**
- **There are several aspects that introduce a new complexity not only in regional transport but also in the global context and the environmental impact is one of them.**
- **The development of the Danube River as a backbone for inland navigation is a fundamental issue for sustainable transport in Europe.**
- **There is a significant potential of renewable energy sources in the regions that will be connected to the OBOR corridors.**
- **There are well developed analysis and optimization tools to address the complexity of the new issues.**
- **The Universities could play a major role in the process of evaluation and definition of the new concepts.**

Thank you for your attention!

and please, send your comments at:
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