Welcome to

EOPSA

EUROPEAN ONSHORE POWER SUPPLY ASSOCIATION

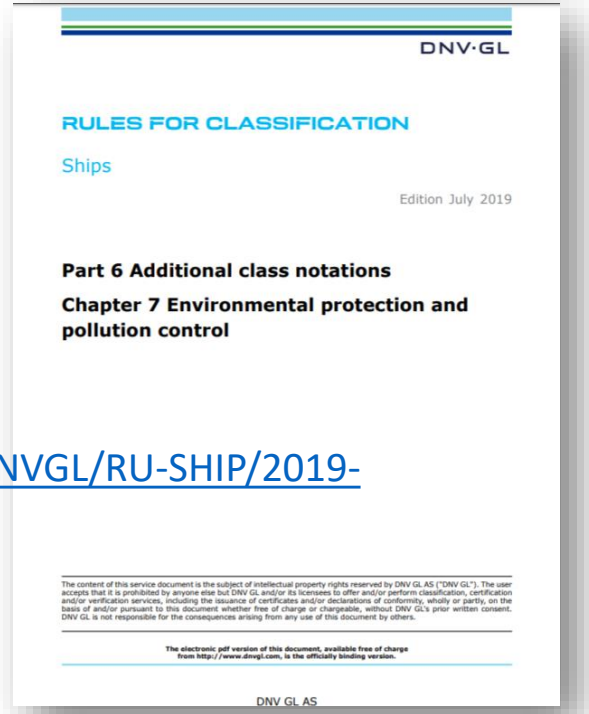
Onshore power supply (OPS) is also known as **Shore side electricity (SSE),** Shore Connection, Shore-to-ship Power, Cold ironing, Alternative Maritime Power, etc.

Background

While in port, most ships use their main and/or auxiliary [fossil fuel] engines (AE) to produce electricity.

Onshore Power Supply (Shore side energy, cold ironing, etc.) has the potential to eliminate **ships** engines emissions in ports and cities, reducing each pollutant by about 90% and greenhouse gas emissions by 50%, as well as reducing noise, vibration and engine wear-and-tear;

EOPSA' Members elaborate, manufacture and build the advanced solutions for transforming today's ships stopovers in ports to be greener, competitive and strategic. A truly sustainable future will be based on safe, efficient and innovative technologies and structures.


DNV·GL

RULES FOR CLASSIFICATION

Ships

Edition July 2019

Part 6 Additional class notations

Chapter 7 Environmental protection and pollution control

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http://rules.dnvgl.com/docs/pdf/DNVGL/RU-SHIP/2019-07/DNVGL-RU-SHIP-Pt6Ch7.pdf

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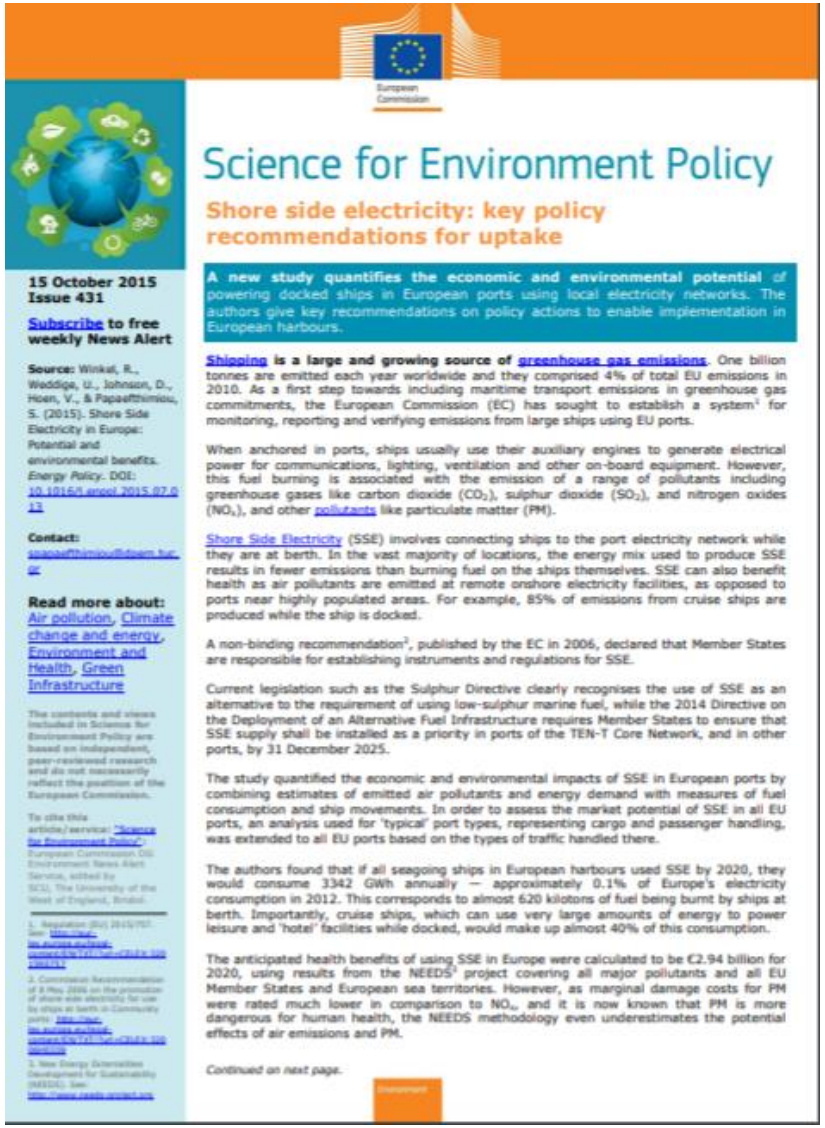
EUROPEAN ONSHORE POWER SUPPLY ASSOCIATION

Background

https://ec.europa.eu/environment/integration/research/newsalert/pdf/shore_side_electricity_key_policy_recommendations_for_uptake_431na1_en.pdf



Science for Environment Policy

Shore side electricity: key policy recommendations for uptake

15 October 2015
Issue 431

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A new study quantifies the economic and environmental potential of powering docked ships in European ports using local electricity networks. The authors give key recommendations on policy actions to enable implementation in European harbours.

Shipping is a large and growing source of greenhouse gas emissions. One billion tonnes are emitted each year worldwide and they comprised 4% of total EU emissions in 2010. As a first step towards including maritime transport emissions in greenhouse gas commitments, the European Commission (EC) has sought to establish a system[1] for monitoring, reporting and verifying emissions from large ships using EU ports.

When anchored in ports, ships usually use their auxiliary engines to generate electrical power for communications, lighting, ventilation and other on-board equipment. However, this fuel burning is associated with the emission of a range of pollutants including greenhouse gases like carbon dioxide (CO_2), sulphur dioxide (SO_2), and nitrogen oxides (NO_x), and other pollutants like particulate matter (PM).

Shore Side Electricity (SSE) involves connecting ships to the port electricity network while they are at berth. In the vast majority of locations, the energy mix used to produce SSE results in fewer emissions than burning fuel on the ships themselves. SSE can also benefit health as air pollutants are emitted at remote onshore electricity facilities, as opposed to ports near highly populated areas. For example, 85% of emissions from cruise ships are produced while the ship is docked.

A non-binding recommendation[2], published by the EC in 2006, declared that Member States are responsible for establishing instruments and regulations for SSE.

Current legislation such as the Sulphur Directive clearly recognises the use of SSE as an alternative to the requirement of using low-sulphur marine fuel, while the 2014 Directive on the Deployment of an Alternative Fuel Infrastructure requires Member States to ensure that SSE supply shall be installed as a priority in ports of the TEN-T Core Network, and in other ports, by 31 December 2025.

The study quantified the economic and environmental impacts of SSE in European ports by combining estimates of emitted air pollutants and energy demand with measures of fuel consumption and ship movements. In order to assess the market potential of SSE in all EU ports, an analysis used for 'typical' port types, representing cargo and passenger handling, was extended to all EU ports based on the types of traffic handled there.

The authors found that if all seagoing ships in European harbours used SSE by 2020, they would consume 3342 GWh annually — approximately 0.1% of Europe's electricity consumption in 2012. This corresponds to almost 620 kilotons of fuel being burnt by ships at berth. Importantly, cruise ships, which can use very large amounts of energy to power leisure and 'hotel' facilities while docked, would make up almost 40% of this consumption.

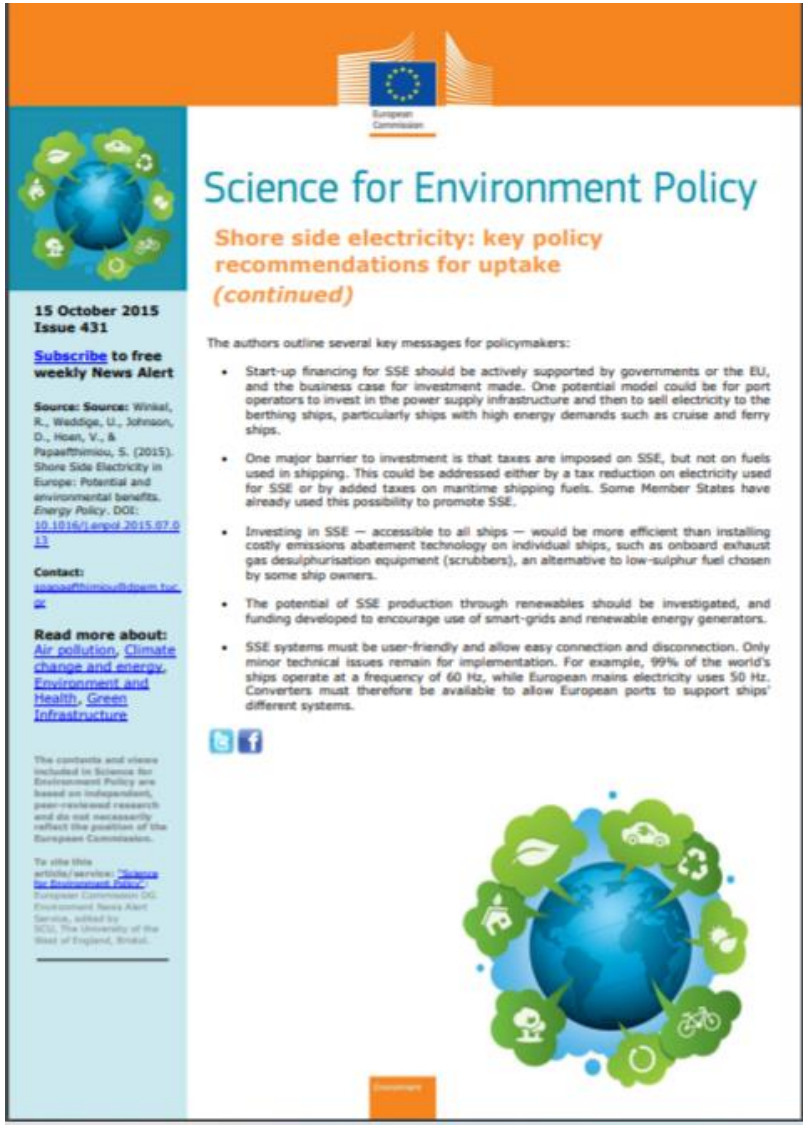
The anticipated health benefits of using SSE in Europe were calculated to be €2.94 billion for 2020, using results from the NEEDS[3] project covering all major pollutants and all EU Member States and European sea territories. However, as marginal damage costs for PM were rated much lower in comparison to NO_x, and it is now known that PM is more dangerous for human health, the NEEDS methodology even underestimates the potential effects of air emissions and PM.

Continued on next page.

Source: Winkel, R., Weddige, U., Johnson, D., Hoen, V., & Papaefthimiou, S. (2015). Shore Side Electricity in Europe: Potential and environmental benefits. *Energy Policy*. DOI: 10.1016/j.enpol.2015.07.013

Contact: papaefthimiou@dpem.tuc.gr

Read more about: Air pollution, Climate change and energy, Environment and Health, Green Infrastructure



Science for Environment Policy

Shore side electricity: key policy recommendations for uptake *(continued)*

15 October 2015
Issue 431

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Source: Source: Winkel, R., Weddige, U., Johnson, D., Hoen, V., & Papaefthimiou, S. (2015). Shore Side Electricity in Europe: Potential and environmental benefits. *Energy Policy*. DOI: 10.1016/j.enpol.2015.07.013

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Read more about: Air pollution, Climate change and energy, Environment and Health, Green Infrastructure

The authors outline several key messages for policymakers:

- Start-up financing for SSE should be actively supported by governments or the EU, and the business case for investment made. One potential model could be for port operators to invest in the power supply infrastructure and then to sell electricity to the berthing ships, particularly ships with high energy demands such as cruise and ferry ships.
- One major barrier to investment is that taxes are imposed on SSE, but not on fuels used in shipping. This could be addressed either by a tax reduction on electricity used for SSE or by added taxes on maritime shipping fuels. Some Member States have already used this possibility to promote SSE.
- Investing in SSE — accessible to all ships — would be more efficient than installing costly emissions abatement technology on individual ships, such as onboard exhaust gas desulphurisation equipment (scrubbers), an alternative to low-sulphur fuel chosen by some ship owners.
- The potential of SSE production through renewables should be investigated, and funding developed to encourage use of smart-grids and renewable energy generators.
- SSE systems must be user-friendly and allow easy connection and disconnection. Only minor technical issues remain for implementation. For example, 99% of the world's ships operate at a frequency of 60 Hz, while European mains electricity uses 50 Hz. Converters must therefore be available to allow European ports to support ships' different systems.

EOPSA
EUROPEAN ONSHORE POWER SUPPLY ASSOCIATION

Vision, Mission, Values

For Founding Member' ratification

Vision:

Energising port sustainability

Mission:

EOPSA will work under the direction of its Board of Director to further the viability of onshore power supply in Europe, serving to be the premier go-to organisation for issues as the European Green Deal, port & ships sustainability strategy and port grid integrity. EOPSA's main mission is to help its members network, stay informed and bring collegial issues to key decision makers.

Values:

Sustainability, Diversity, Integrity, Innovation

EUROPEAN ONSHORE POWER SUPPLY ASSOCIATION

Mission & Objectives

The mission of EOPSA is to provide a wide range of services and activities internationally and in Europe for the benefit of the Shore Side Electricity, including Ports, shipping companies and equipment manufacturers.

In order to achieve its strategic vision and mission, The EOPSA defined:

- The promotion of the mutual interests of its members
- To promote the design, construction, refit, maintenance and modernisation of all SSE solutions by using state-of-the-art-technologies for cleaner air in and around ports
- To follow regulatory bodies
- To promote fair trade and normal competitive conditions in Europe and worldwide
- To represent the interests of the sector with European and global institutions/organisations and general public in order to maintain and enhance its recognition as strategic industry
- To inform European and global institutions and organisations of relevant technical, economic and legislative/administrative issues
- To promote co-operation between all companies covered by the membership
- To promote co-operation between the member associations, to facilitate contacts and networking between members and non-members
- To participate in and inform the member associations about international developments in the SSE industry and to develop arrangements for the exchange of general market and policy information
- To promote and facilitate research, development and innovation in the sector including the promotion of relevant projects and the dissemination of results among its members

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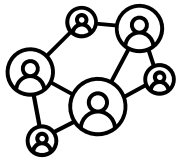
Mission & Objectives



Network

Inform

Represent

EUROPEAN ONSHORE POWER SUPPLY ASSOCIATION

Governance

General Assembly

Board
Up to 15 members

- Founding Chairman
- Vice-Chairman 1
- Vice-Chairman 2
- Vice-Chairman 3
- Vice-Chairman 4

Secretariat

Directors Committee

- Technical and Environment
- Market & Trade
- Classification
- Human Capital
- Finance and Legal
- EU Green Deal

- Policy Area
- Special Business
- Tools

- Events
- Publications & Videos
- Press Release

Founding Members

Eneco

Schneider Electric (*)

ACTEMIUM (*)

(*) Pending FM Status Approvals

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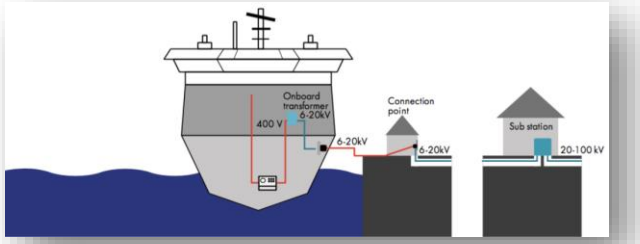
Existing Projects



https://www.eafo.eu/shipping-transport/port-infrastructure/ops/technology

Sources: *EAFO Research, ESPO, EFIP, ABB, Schneider Electric, T&D Europe, CLEANSHIP final report, NPFs, Ministry of Transport Spain*

EAFO overview Onshore Power Supply (OPS) for shipping in Europe (update: May 2020)

Country	Port (City)	Quay (location details)	Latitude	Longitude	GPS coordinates	Connecting points	Types of vessel	Voltage HV/LV	Voltage (kV)	Frequency (Hz)	Max Power (MW)	TEN-T	Year installed
Belgium	Antwerp		51.22	4.4	Port	1	Container ship	High Voltage	6.6		0.8	Core	2008
Belgium	Zeebrugge		51.33	3.2	Port	1	RoRo	High Voltage	6.6		1.25	Core	2006
Denmark	Frederikshavn	Navy port	57.43	10.55	Port		Navy vessels	High Voltage			4.48	Comprehensive	2016
Denmark	Helsingor	Ferry Terminal	56.03	12.62	Port	1	Ferry	High Voltage	11		4.5	Comprehensive	2018
Finland	Helsinki		60,15	24,92	Port	1	Ferry, Roro	High Voltage				Core	2020
Finland	Kemi		65.73	24.56	Port	1	RoPax	High Voltage	6.6			Comprehensive	2006
Finland	Oulu		65.02	25.47	Port	1	RoPax	High Voltage	6.6			Comprehensive	2008
France	Antibes	Quai des Milliardaires	43.58	7.13	Port	1	Maxi Yacht	High Voltage	6,6		1.2		2015
France	Dunkerque	Quai des Flandres	51.05	2.38	Port	1	Container	High Voltage	6,6		6	Core	2019
France	Marseille	La Joliette	43.32	5.37	Port	3	Ferry , RoRo	High Voltage	11		1.44	Core	2015
Germany	Hamburg		53.55	9.93	Port	1	cruiseship	High Voltage	11		9.8	Core	
Germany	Kiel		54.33	10.13	Port		ferry Oslo-Kiel ,Cruise	High Voltage	10		4,5	Comprehensive	2019
Germany	Lübeck		53.96	10.88	Port	2	ROPAX	High Voltage	11		3.5	Core	2010
Germany	Lübeck		53.955	10.88	Port	2	Container <140m	High Voltage	6.6		2	Core	
Germany	Lübeck		53.955	10.875	Port		Cruise	High Voltage	11		9.8	Core	
Germany	Lübeck		53.88	10.7	Port	2	RoRo and vehicle vessels	High Voltage	11		3.5	Core	
Greece	Ancona		43.62	13.51	Port	2	Shipyard	High Voltage	0,44 / 0,69		1.6		2016
Latvia	Liepaja		56.52	21.02	Port	2	RoRO and vehicle vessels	High Voltage	10		0.5	Comprehensive	
Latvia	Riga	FreePort	56.95	24.1	Port	2	Container	High Voltage	6,6		1.6	Core	2014
Malta	Delimara		35.83	14.56	Port	1	LNG to Power Floating Storage	High Voltage	6,6		2.4		2016
Netherlands	Hoek van Holland		51.98	4.13	Port		Ro-ro/Ferry	High Voltage			4.8		2012
Netherlands	Rotterdam		51.9	4.48	Port	2	RoPax	High Voltage	11		2.8	Core	2012
Norway	Bergen	Skolten / Montelabo	60.4	5.33	Port	3	3 cruiseships	High Voltage	11 / 6,6		12.8		2020
Norway	Larvik		59.04	10.05	Port	1	Ro-ro/Ferry	High Voltage	11		1.8		2015
Norway	Oslo		59.90	10.74	Port	1	Cruise ship	High Voltage	11		4.5		2018
Norway	Sandefjord		59.12	10.22	Port	1	Ro-ro/Ferry	High Voltage	11		2.75		2017
Spain	Palma de Mallorca	Muelles Paraires - Norte	39.552722	2.627161	OPS	1	Ferry	High Voltage	11	60	1.6	Core	2020
Sweden	Gothenburg		57.70	11.95	Port	6	RoRo, RoPax	High Voltage	6.6 & 11		1.25-2.5	Core	2000
Sweden	Helsingborg	Ferry Terminal	56.04673	12.69437	Port	1	Ferry	High Voltage	11		4.5	Comprehensive	2018
Sweden	Stockholm	Port of Värtahamnen	59.35250	18.1144444	Port	2	RoPax	High voltage	11	50	6 (2*3)	Core	2019
Sweden	Stockholm	Port of Nynäshamn	58 54'	17 57'	Port	1	RoPax	High voltage	6.6	60	2	Core	2017
Sweden	Trelleborg		55.37	13.15	Port	6	Ferry	High Voltage	10.5		0-3.2	Core	2017
Sweden	Ystad		55.43	13.83	Port	1	Cruise ship	High Voltage	11		6.25-10	Comprehensive	2013
Sweden	Visby	Ferry Terminal	57.64	18.28	Port	4	Ferry	High Voltage	11		5	Comprehensive	2019
Switzerland	Basel (Inland)	Dreilaendereck / St. Johann	47.562135	7.586467	OPS		River Cruiseships	High Voltage	5,8	2,67			
Austria	Ennshafen	Inland Port	48,23	14,51	Port	30	Inland vessels	Low Voltage	0,4	50	1.4 (total)	Core	1995-2010
Denmark	Kalundborg		55.68	11.1	Port	22		Low Voltage	0.4		0.065	Comprehensive	
						10	RoPax	Low Voltage	0.4		0.350-0.600	Core	
						1	Oil & Product tankers	Low Voltage	0.4		0.140	Core	
						8	Barges	Low Voltage	0.4		0.210-0.800	Core	
						4	Ferries	Low Voltage	0.4		0,175	Core	
Finland	Helsinki		60.17	24.97	Port	6	other	Low Voltage	0.4		0,175	Core	
France	Le Havre (Inland)	Terminal Multimodal	49.27	0.29	OPS	2	Barges	Low voltage	0,41 / 0,23	50	0,05	Core	2018
France	Le Havre (Inland)	Tancarville ancienne écluse	49.28	0.27	OPS	1	Barges	Low voltage	0,41 / 0,23	50	0,05	Core	2018
France	Port de Paris (Inland)	Darse 3 Port de Gennevilliers	48.9	2.27		1	Barges	Low voltage	0,41 / 0,25	50	0,05	Core	2018
France	Rouen (Inland)	Quai Emile Duchemin	49,4	1,06		2	Barges	Low voltage	0,41 / 0,24	50	0,05	Core	2018
Latvia	Riga		56.96	24.1	Port	5		Low Voltage	0.4		0.25	Core	
Latvia	Ventspils		57.4	21.53	Port	23		Low Voltage	0.4		0,05	Core	
Lithuania	Klaipeda		55.72	21.12	Port	1	Oil & Product tankers	Low Voltage	0.4		0.015	Core	
Lithuania	Klaipeda		55.71	21.12	Port	5	Barges	Low Voltage	0.4		0.4	Core	
Lithuania	Klaipeda		55.70	21.12	Port	1	Ferries	Low Voltage	0.4		0.4	Core	
Norway	Bergen	Skolten	60.4	5.31	Port	1	OSV	Low Voltage	0,4		0,8		2015
Norway	Floro	Fjordbase	61.6	5.03	Port	3	OSV	Low Voltage	0,44 / 0,69		0,8		2017
Portugal	Leixões		41.18	8.70	Port	9	Tugs and other vessels	Low Voltage	0,4	50	0,0825 / CP	Core	1980-2020
Slovakia	Bratislava (Inland)	Cargo Port	48.08.13.6	17.08.47.1	Port	3	unspecified/ river	Low Voltage	0,4	50	(connection poir	Core	2009
Spain	Melilla	Terminal de ferries	35.291389	2.931372	OPS	1	Ferry	Low Voltage	0,4	50	0.8	Comprehensive	2014
Spain	Motril	Muelle de Costa	36.723133	3.523067	OPS	1	Ferry	Low Voltage	0,42	50	0.8	Comprehensive	2018
Spain	Motril	Muelle de Levante	36.722547	3.522778	OPS	1	Ferry	Low Voltage	0,42	50	0.8	Comprehensive	
Spain	Palma de Mallorca	Muelles Paraires - Sur	39.550672	2.624514	OPS	1	Ferry	Low Voltage	0,4	50		Core	
Spain	SC de La Palma	Dique Este	28.677581	17.765861	OPS	1	Ferry	Low Voltage	0,4	50	0.5	Comprehensive	2019
Spain	SC de La Palma	Pantalán	28.677989	17.76665	OPS	1	Ferry	Low Voltage	0,4	50		Comprehensive	
Spain	SC de Tenerife	Pantalán Anaga - Ribera	28.469778	16.244472	OPS	1	Ferry	Low Voltage	0,4	50	1.44	Core	
Spain	SC de Tenerife	Pantalán Anaga - Dique Este	28.469833	16.244711	OPS	1	Ferry	Low Voltage			1.44	Core	
Spain	SC de Tenerife	Ribera I	28.469594	16.246339	OPS	1	Ferry	Low Voltage	0,4	50	0.2	Core	
Spain	SS de La Gomera	Dique del Este (Ro-pax)	28.084803	17.1084	OPS	1	Ferry	Low Voltage	0,4	50	0.4	Comprehensive	
Spain	SS de La Gomera	Dique del Este (Fast ferris)	28.086358	17.107792	OPS	1	Ferry	Low Voltage	0,4	50	0.140	Comprehensive	
Sweden	Stockholm	Port of Frihamnen	59.3450	18.1300	Port	2	RoPax	Low voltage	0,69	50	4 (2*2)	Core	1990's
Sweden	Stockholm	Port of Stadsgården	59.316667	18.09611	Port	2	RoPax	Low voltage	0,69	50	4 (2*2)	Core	1980's
UK	Fraserburgh		57.62	-2	Port	6	Fishing vessel	Low Voltage	Multiple		< 0,5		2015
UK	Stromness	Ferry Terminal	58.96	-3.3	Port	1	Ferry	Low Voltage	10		0,8		2019

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Social Media

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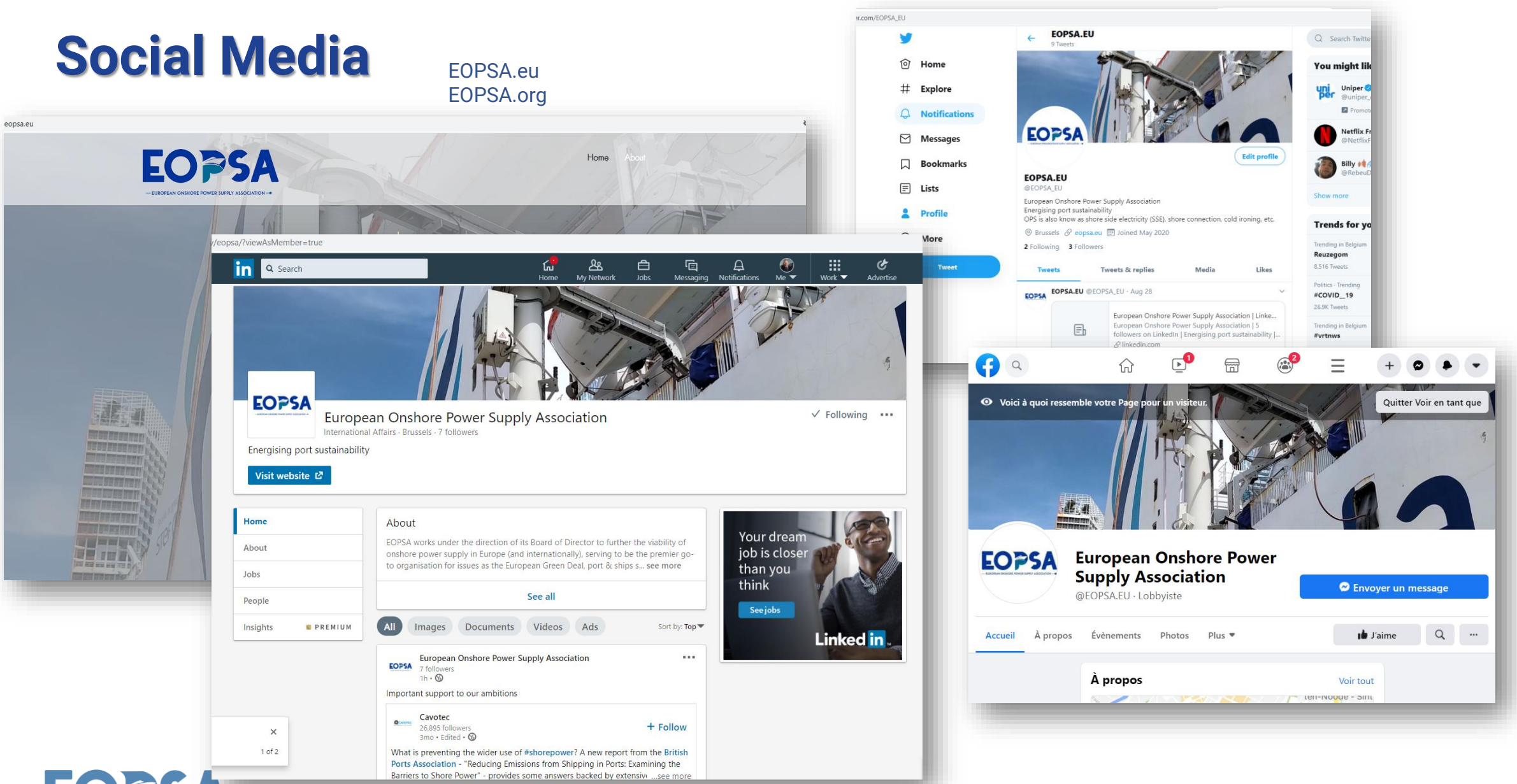

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EOPSA “not-for-profit” Legal Structure

Notary:	Kumps & Donner, La Hulpe
Accounting:	BDH Consult
Legal:	C-Consult
Name:	EOPSA, European Onshore Power Association
Legal Structure:	**Not-for-profit association (ASBL - Association sans but lucrative)**
Governance:	Board of Founding Members (7 seats), Board of directors (15 seats)
Custodian:	Mandalay srl , Rue Charles Jaumotte, 31, 1300 Limal
Head office:	Rond Point Schuman 2-4, 1000 Bruxelles (tbd) • Inform • Represent • Network
Board Meetings:	February, April, September, December
AGM:	3rd week of June
Financial Year:	31st Dec

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