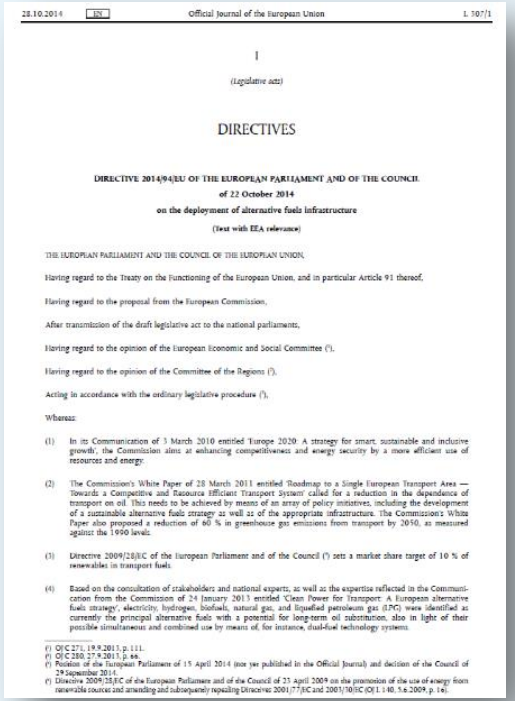
Prospects for energy and maritime transport in the Nordic region
Expert workshop 26-27 February 2020
Thor André Berg - Plug

Shore Power – There is work to do!



28.10.2014 EN Official Journal of the European Union L 307/1

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(Legislative acts)

DIRECTIVES

DIRECTIVE 2014/94/EU OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL
of 22 October 2014
on the deployment of alternative fuels infrastructure
(Text with EEA relevance)

THE EUROPEAN PARLIAMENT AND THE COUNCIL OF THE EUROPEAN UNION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 91 thereof,

Having regard to the proposal from the European Commission,

After transmission of the draft legislative act to the national parliaments,

Having regard to the opinion of the European Economic and Social Committee (1),

Having regard to the opinion of the Committee of the Regions (2),

Acting in accordance with the ordinary legislative procedure (3),

Whereas:

(1) In its Communication of 3 March 2010 entitled 'Europe 2020: A strategy for smart, sustainable and inclusive growth', the Commission aims at enhancing competitiveness and energy security by a more efficient use of resources and energy.

(2) The Commission's White Paper of 28 March 2011 entitled 'Roadmap to a Single European Transport Area — Towards a Competitive and Resource Efficient Transport System' called for a reduction in the dependence of transport on oil. This needs to be achieved by means of an array of policy initiatives, including the development of a sustainable alternative fuels strategy as well as of the appropriate infrastructure. The Commission's White Paper also proposed a reduction of 60 % in greenhouse gas emissions from transport by 2050, as measured against the 1990 levels.

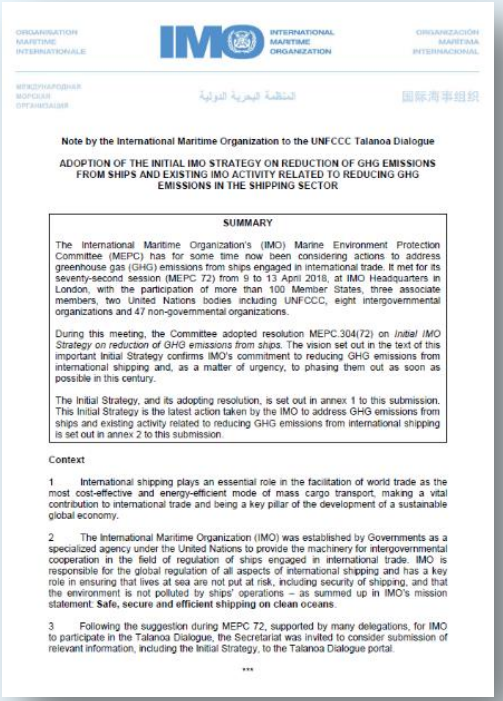
(3) Directive 2009/28/EC of the European Parliament and of the Council (4) sets a market share target of 10 % of renewables in transport fuels.

(4) Based on the consultation of stakeholders and national experts, as well as the expertise reflected in the Communication from the Commission of 24 January 2013 entitled 'Clean Power for Transport: A European alternative fuels strategy', electricity, hydrogen, biofuels, natural gas, and liquefied petroleum gas (LPG) were identified as currently the principal alternative fuels with a potential for long-term oil substitution, also in light of their possible simultaneous and combined use by means of, for instance, dual-fuel technology systems.

(1) OJ C 271, 19.9.2013, p. 111.
(2) OJ C 280, 27.9.2013, p. 66.
(3) Position of the European Parliament of 15 April 2014 (not yet published in the Official Journal) and decision of the Council of 29 September 2014.
(4) Directive 2009/28/EC of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (OJ L 140, 5.6.2009, p. 16).

Member States shall ensure that the need for shore-side electricity supply for inland waterway vessels and seagoing ships in maritime and inland ports is assessed in their national policy frameworks.

…encourage port developments and activities globally to facilitate reduction of GHG emissions from shipping, including provision of ship and shore-side/on-shore power supply from renewable sources…



ORGANISATION MARITIME INTERNATIONALE — IMO INTERNATIONAL MARITIME ORGANIZATION — ORGANIZACIÓN MARITIMA INTERNACIONAL

МЕЖДУНАРОДНАЯ МОРСКАЯ ОРГАНИЗАЦИЯ — المنظمة البحرية الدولية — 国际海事组织

Note by the International Maritime Organization to the UNFCCC Talanoa Dialogue

ADOPTION OF THE INITIAL IMO STRATEGY ON REDUCTION OF GHG EMISSIONS FROM SHIPS AND EXISTING IMO ACTIVITY RELATED TO REDUCING GHG EMISSIONS IN THE SHIPPING SECTOR

SUMMARY

The International Maritime Organization's (IMO) Marine Environment Protection Committee (MEPC) has for some time now been considering actions to address greenhouse gas (GHG) emissions from ships engaged in international trade. It met for its seventy-second session (MEPC 72) from 9 to 13 April 2018, at IMO Headquarters in London, with the participation of more than 100 Member States, three associate members, two United Nations bodies including UNFCCC, eight intergovernmental organizations and 47 non-governmental organizations.

During this meeting, the Committee adopted resolution MEPC.304(72) on *Initial IMO Strategy on reduction of GHG emissions from ships*. The vision set out in the text of this important Initial Strategy confirms IMO's commitment to reducing GHG emissions from international shipping and, as a matter of urgency, to phasing them out as soon as possible in this century.

The Initial Strategy, and its adopting resolution, is set out in annex 1 to this submission. This Initial Strategy is the latest action taken by the IMO to address GHG emissions from ships and existing activity related to reducing GHG emissions from international shipping is set out in annex 2 to this submission.

Context

1 International shipping plays an essential role in the facilitation of world trade as the most cost-effective and energy-efficient mode of mass cargo transport, making a vital contribution to international trade and being a key pillar of the development of a sustainable global economy.

2 The International Maritime Organization (IMO) was established by Governments as a specialized agency under the United Nations to provide the machinery for intergovernmental cooperation in the field of regulation of ships engaged in international trade. IMO is responsible for the global regulation of all aspects of international shipping and has a key role in ensuring that lives at sea are not put at risk, including security of shipping, and that the environment is not polluted by ships' operations – as summed up in IMO's mission statement: **Safe, secure and efficient shipping on clean oceans**.

3 Following the suggestion during MEPC 72, supported by many delegations, for IMO to participate in the Talanoa Dialogue, the Secretariat was invited to consider submission of relevant information, including the Initial Strategy, to the Talanoa Dialogue portal.

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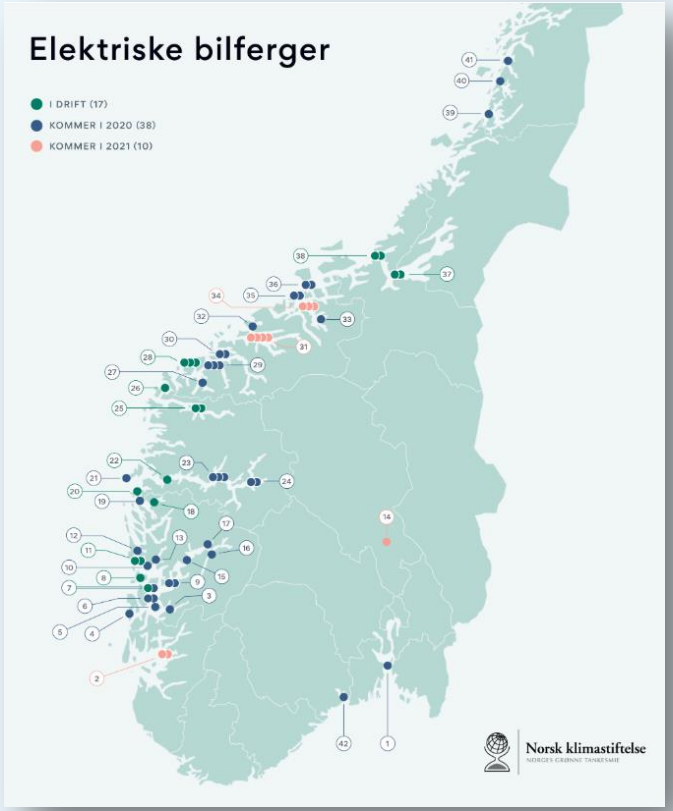
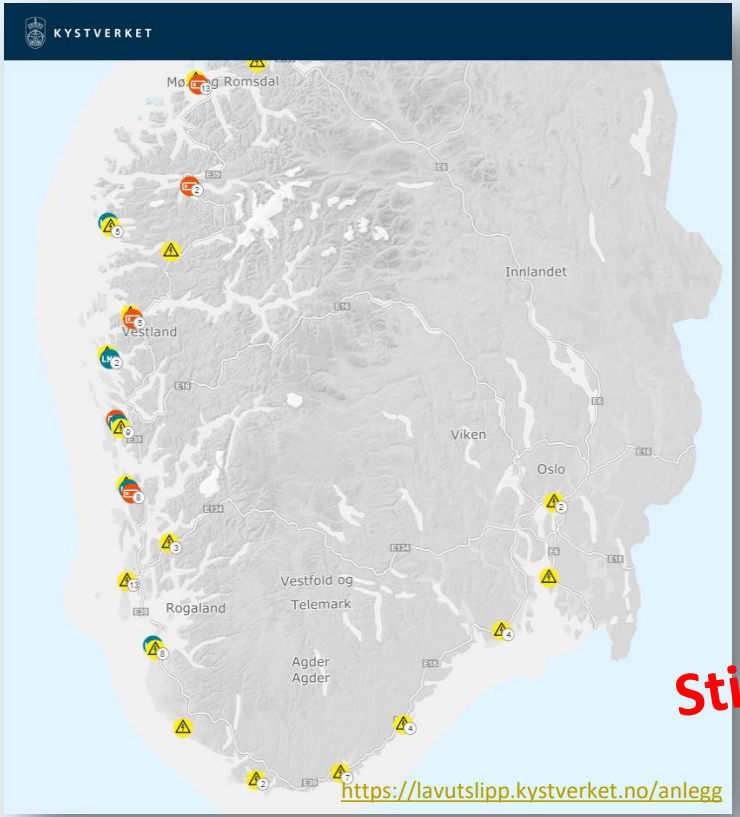
Keeping in mind it´s only part of the solution.

Things are happening



Electric car ferries

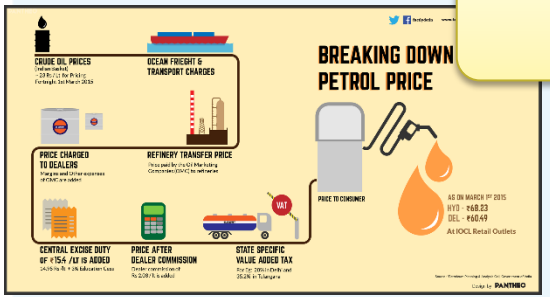


Still to slow!

Shore Power facilities

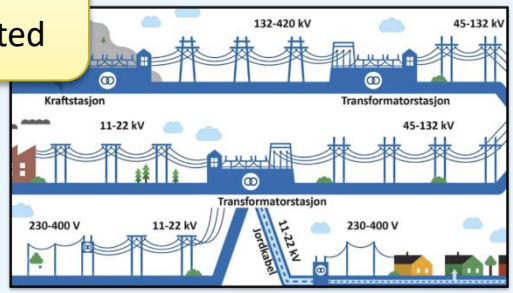
It´s a competition!

OK



I have energy needs!

It´s complicated

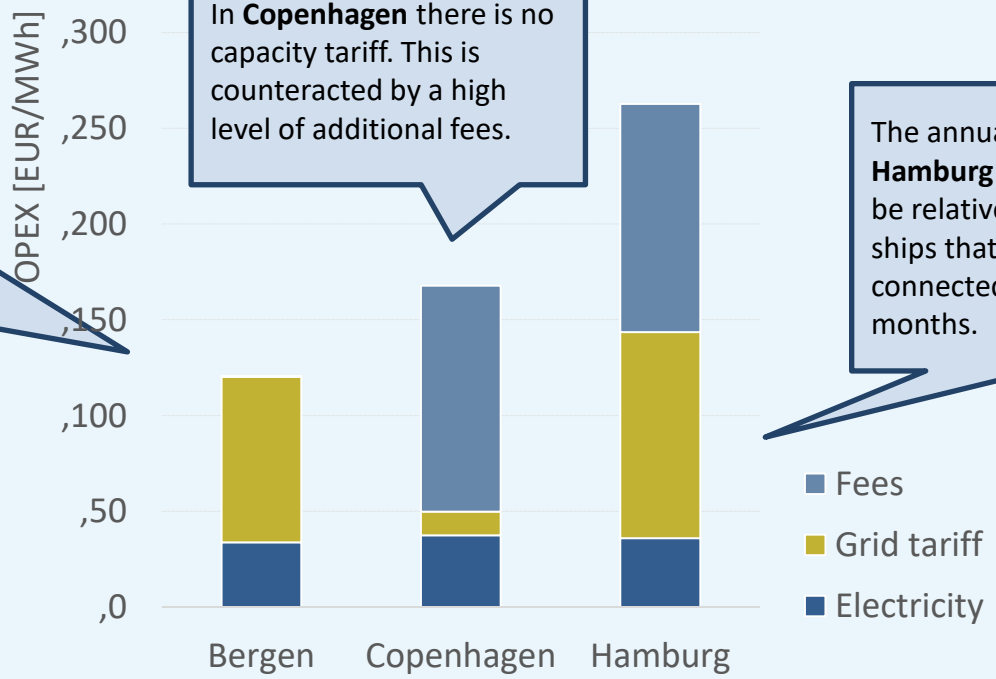


You can always get fossile fuels.
You may/may not get renewables because…

In **Bergen** commercial vessels pay close to zero energy levy. They pay the low rate reserved for power intensive consumers rather than the regular rate.

In **Copenhagen** there is no capacity tariff. This is counteracted by a high level of additional fees.

The annual capacity fee in **Hamburg** causes grid tariffs to be relatively high for cruise ships that are docked and connected only in the summer months.



Excample case:
10 MW peak for 5 months,
Total consumption 3 GWh,
Only daytime connection 9 am-4 pm

Source: THEMA Consulting Group

We want happy customers!

And a level playing field with fossils…

Combining forces with the local harbour
Taking care of everything shoreside


«Every ship shall be offered Shore Power»
Municipality of Bergen
Bontelabo
Nordnes
Nøstet
Hurtigrutekaien
Dokken
Puddefjorden
Offshore / low voltage — In use
Offshore / low voltage — 2019 2020
Cruise / high voltage — 2020
Bergen Havn
PLUG

Different Harbours – Different ships – Different needs

	Supply (OSV)	Coastal express	Cruise	Ferries
Calls per year	800 +	365	340+	4-15 000
Simultaneous	up to 14	1	3 / 4	1
Lenght of stay	Hours - weeks	5-9 hours	6 hours - 3 days	4-15 minutes
Frequency	60 Hz (50 Hz)	50 Hz	60 Hz (50 Hz)	50 Hz (DC/Induction)
Power need	200-600 kW	800-1200 kW + charging	2000-12000 kW (+ chg.)	500-9000 kW charging
Voltage	400 V / 440 V / 690 V	690V (660 V)	11 kV (6,6 kV)	Low / High
Plug	IEC 80005-3	NG3 Plug	IEC 80005-1	All kinds

Europe’s largest Shore Power facility for Cruise

- Opens in May 2020
- 3 cruise ships simultaneously
- 3 x 16.000 kVA
- Max 32.000 kVA at the same time

- And there´s more…

- The fourth quay
- Uses the same converters
- 2,6 km sea cable
- Opens in June 2020…

Converters 50/60 Hz

The big cost, and footprint, of shorepower

Hamburg Altona, 12 MVA, one ship at a time

Kristiansand, 16 MVA, one ship at a time

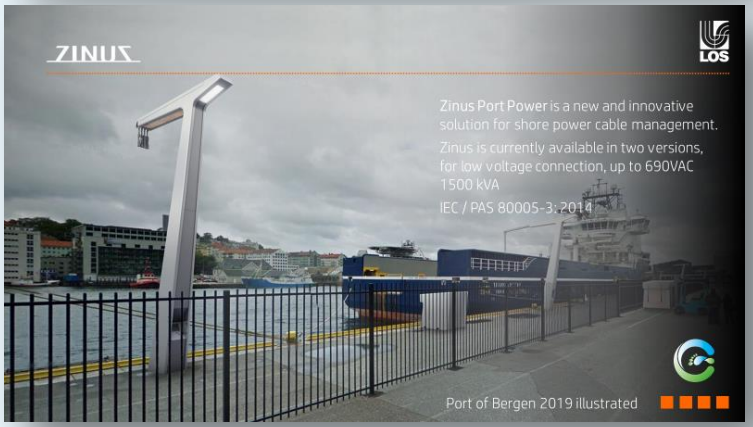
Bergen, 48 MVA, three ships at a time

One week ago.

PowerCon

Converters

Cable Management Systems.

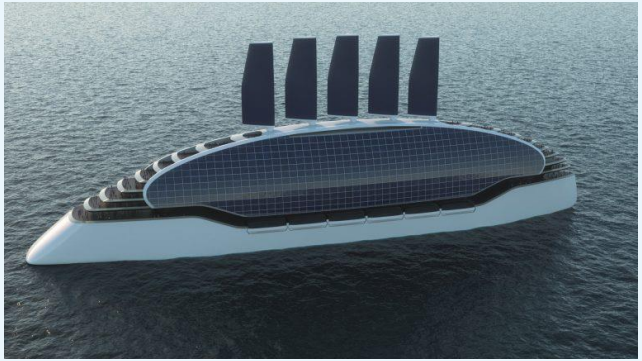


The industry is gearing up!

To reach the goals set by the Nordic countries, clean shipping has to be a big industry.

Who will act on it?

In time?



Cruise consepts from:

Norwegian Centres of Expertise
NCE Maritime CleanTech

Any ideas? Questions?

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