CONVEGNO ENA

Ancona 21/01/2012

SISTEMI CERTIFICATIVI PER LO SVILUPPO ECOSOSTENIBILE DELLA NAUTICA

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Mandatory International Rules

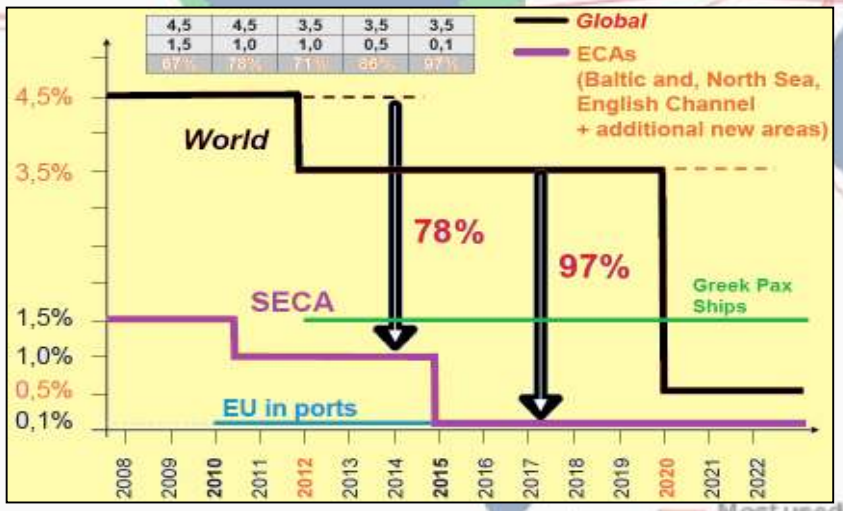
La normativa MARPOL si applica anche agli yacht (sia in servizio privato che commerciale):

- Annex I – Prevenzione inquinamento acque oleose
- Annex IV – Prevenzione inquinamento acque nere (
- Annex V – Prevenzione inquinamento da rifiuti solidi
- Annex VI – Prevenzione inquinamento atmosferico (NOx, SOx, sostanze sviluppanti ozono): motori con potenza maggiore di 130 kW

Focus su Air Emissions

Air Emissions - IMO Rules

SOx



NOx

		2000	2011	2016 .....
Old Reg. 13		TIER 1		
New Reg. 13	Outside NECA	TIER I	TIER II	
	Inside NECA	TIER I	TIER I	TIER III

CO2

1. **Technical measures:**
   Energy Efficiency Design Index (EEDI) new ships
2. **Operational measures:**
   Ship Energy Efficiency Management Plan (SEEMP)
   Energy Efficiency Operational Indicator (EEOI)
3. **Marked Based Instruments**

existing ECAs: Baltic Sea, North Sea

discussed ECAs: Coasts of Mexico, Coasts of Alaska and Great Lakes, Singapore, Hong Kong, Korea, Australia, Black Sea Mediterranean Sea Tokyo Bay

Convenzioni Internazionali

Altre Convenzioni Internazionali applicabili agli yacht:

- **Anti-Fouling System Convention 2001**
- **Ballast Water Management Convention 2004**, adottata nel 2004 ma non ancora in vigore
- **Ship Recycling Convention 2009**, adottata nel 2009 ma non ancora entrata in vigore
- **Energy Efficiency Design Index:** misure introdotte da IMO per ridurre emissioni di CO2 (da 01/01/2013)

Evoluzione del comparto nautico

Da…

Regole Obbligatorie

- **Nuovi sviluppi IMO**
- **Innovazioni tecnologiche**
- **Spinta al risparmio combustibile**
- **Richiesta della clientela**
- **Aspettative dell'opinione pubblica**

…A

Tecnologie green su base volontaria

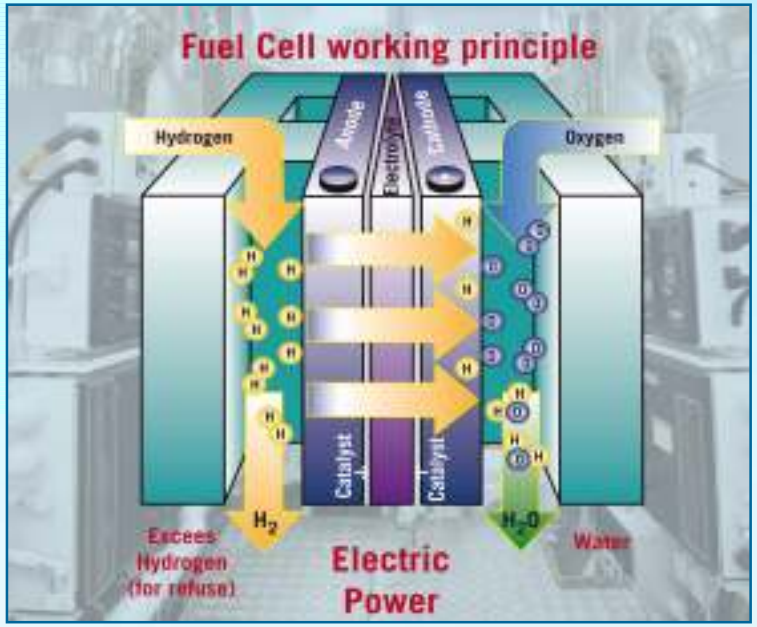
ESEMPIO IMBARCAZIONE GREEN

- Propulsione Ibrida
- Celle Combustibili
- Infusione
- Isolamento termico
- Ottimizzazione Idrodinamica Carena
- Propulsori ad alta efficienza

IMBARCAZIONI (L < 24 m)

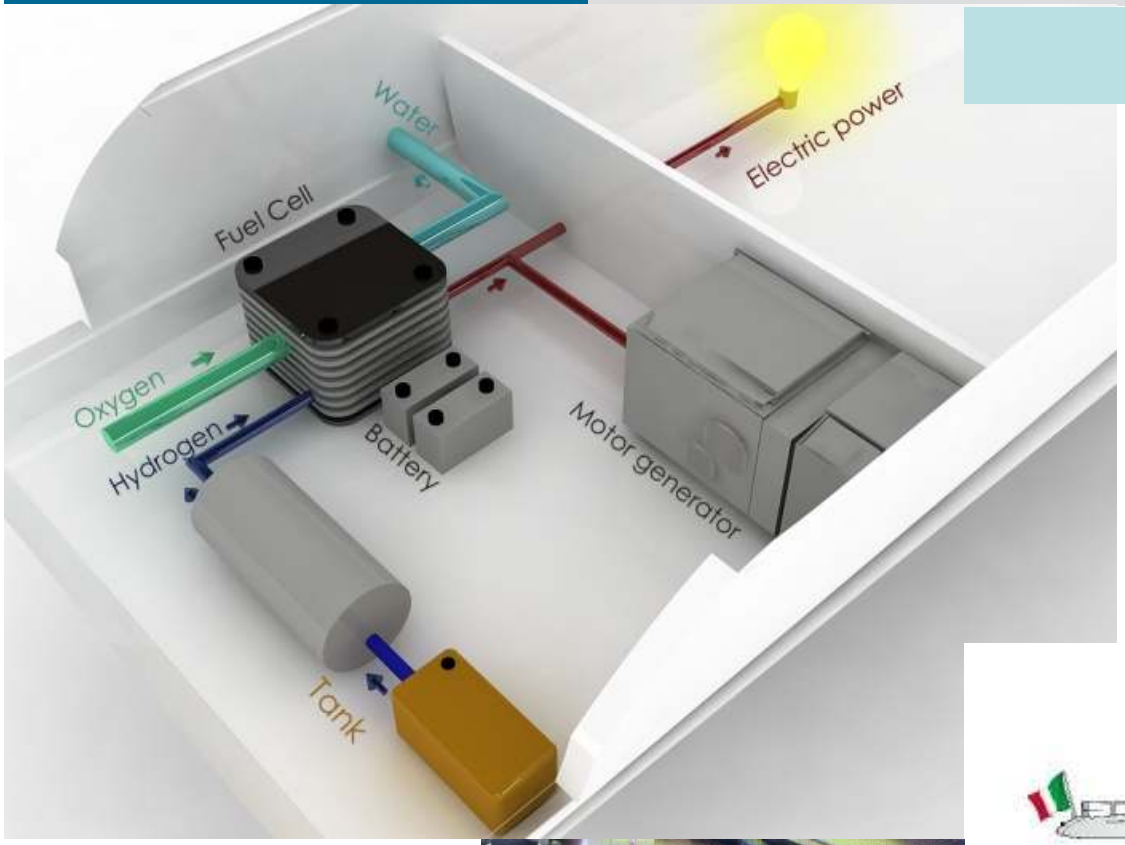
Alcuni esempi di soluzioni "green"

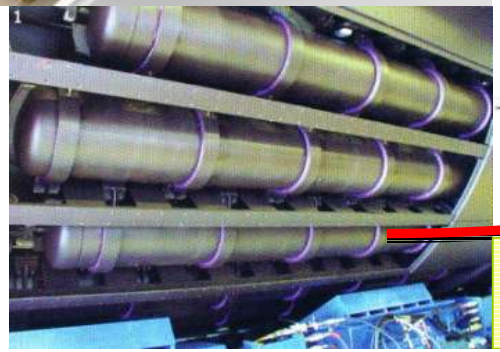
- Non fossil fuels (vele, celle combustibile, etc.)
- Cold ironing
- Ottimizzazioni idrodinamica carena
- Modalità emissioni zero
- Procedure costruttive



ESEMPIO IMBARCAZIONE GREEN

FUEL CELLS



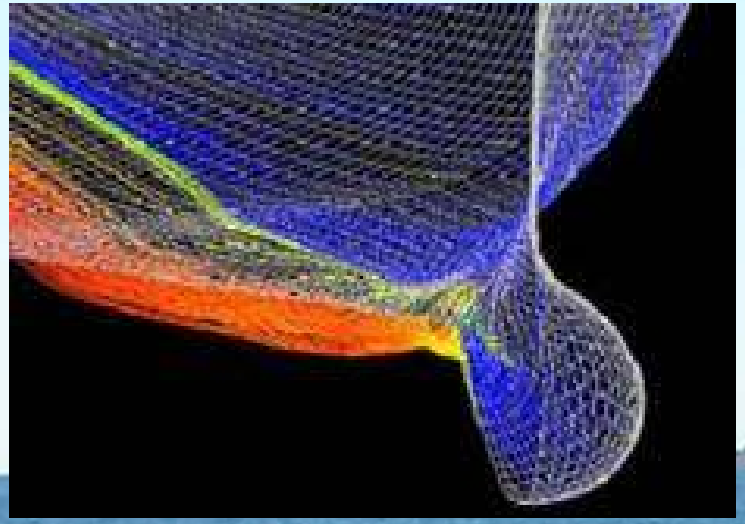


Hydrogen Bottles

MEGA YACHTS

Green House Gases

- Energy saving and energy conservation
- Computerized system to monitor fuel consumption
- CFD & Tank tests for hull and propulsion optimization



MEGA YACHTS

Green House Gases

- Carbon Offsetting
- Low energy consumption lights
- Optimization of Air Conditioning (AC) plant
- Optimum trim and draft

MEGA YACHTS

Green Facilities

- Building procedures
- Selection of materials
- Solvent emissions from painting

Certificazioni Volontarie

GREEN PLUS

12 FONTI ANTINQUINAMENTO

ACQUA

- 1. Acque oleose
- 2. Acque nere
- 3. Rifiuti
- 4. Acqua di zavorra
- 5. Antifouling

ARIA

- 6. Ozone-Depleting Substances
- 7. Green House Gases
- 8. NOx
- 9. SOx
- 10. Particolato (PM)
- 11. CO2

- Procedure e materiali di costruzione

GREEN PLUS

Esempio di Calcolo dell'Indice Ambientale

No.	POLLUTION SOURCE	ITEM	ENVIRONMENTAL INDEX
1	Oil from Machinery Spaces	Bilge Water Treatment (5 ppm with alarm and automatic stop)	10
		Bilge Water Treatment (5 ppm with alarm, automatic stop and recorder)	15
		Dry bilge concept	5
		Sludge oil collection and handling facilities	5
		Sea water-lubricated stern tube bearings	5
		Magnetic coupling on oil pumps	5
		Biodegradable lube oil	5
		Restriction in the use of hydraulic plants	10
2	Sewage	Treatment plant: effluent quality as per IMO MEPC.159(55)	5
		Advanced treatment plant or additional polishing stage: effluent quality as per ADEC Title XIV (33 CFR Part 159 Subpart E)	10
3	Grey water	Treatment plant: effluent quality as per IMO MEPC.159(55)	10
		Advanced treatment plant or additional polishing stage: effluent quality as per ADEC Title XIV (33 CFR Part 159 Subpart E)	15
4	Garbage	Advanced recycling	10
5	Ballast Water	Ballast water treatment	10

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GREEN PLUS

Esempio di Calcolo dell'Indice Ambientale

6	Ozone-Depleting Substances	Restrictions in the use of GWP substances	10[1]
7	Green House Gases and Pollutants	Non fossil fuels (use of electric power generators and/or propulsion systems that do not use prime movers generating GHGs and pollutants (e.g. sails, fuel cells, etc.))	30[1]
		Second generation of bio-fuels	20[1]
		Cold ironing	5
		Tool to manage handling and consumption of fuels	2
		Energy saving and energy conservation	10
		Computerized system to monitor fuel consumption	3
		Optimization of Air Conditioning (AC) plant (including passive means to decrease AC demand, e.g. reflective glazing)	10
		Low energy consumption lights	5
		Hull transom design (adoption of means capable to increase propulsion efficiency by minimum 0.5% at design speed)	3
		Stabilizer openings	3
		Silicone-based antifouling paint	10
		Fluoropolymer antifouling paint	15
		Fins on propeller boss cups	3
		High-performing propellers (capable to increase propulsion efficiency by minimum 1%)	5
		Support tool to assist the Master in keeping most efficient sailing draft and trim	10

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GREEN PLUS

Esempio di Calcolo dell'Indice Ambientale

8	NOx	Gas to liquids (GTL) fuels (NOx emission lower than the limits as per Annex VI to MARPOL 73/78 as amended from prime movers and auxiliary boilers)	15[1]
		Fossil fuel pre-treatment (e.g. water emulsion), or water injection into combustion chamber, or scavenging air, or combination of these (NOx emissions lower than the limits as per Annex VI to MARPOL 73/78 as amended from prime movers and auxiliary boilers)	5[1]
		Dual-fuel engines running with LNG (NOx emissions lower than the limits as per Annex VI to MARPOL 73/78 as amended from prime movers)	15
		Exhaust gas treatment (abatement of not less than 85% of total generated NOx by prime movers)	20
		NOx emissions monitoring and recording	3
9	SOx	SOx limits (1,0%)	20
		SOx limits (0,1%)	30
		Gas to liquids (GTL) fuels (SOx emissions lower than those corresponding to 3 % global limit from prime movers and auxiliary boilers)	10[1]
		Blending fossil fuel with second-generation bio-fuels (SOx emissions lower than 3 % global limit from prime movers and auxiliary boilers)	10[1]
		Dual-fuel engines running with LNG (gasoil only used as back-up in an emergency) (SOx emissions lower than 3 % global limit from prime movers)	10
		Exhaust gas treatment (abatement of not less than 85% of total generated SOx by prime movers)	20
		SOx emissions monitoring and recording	3

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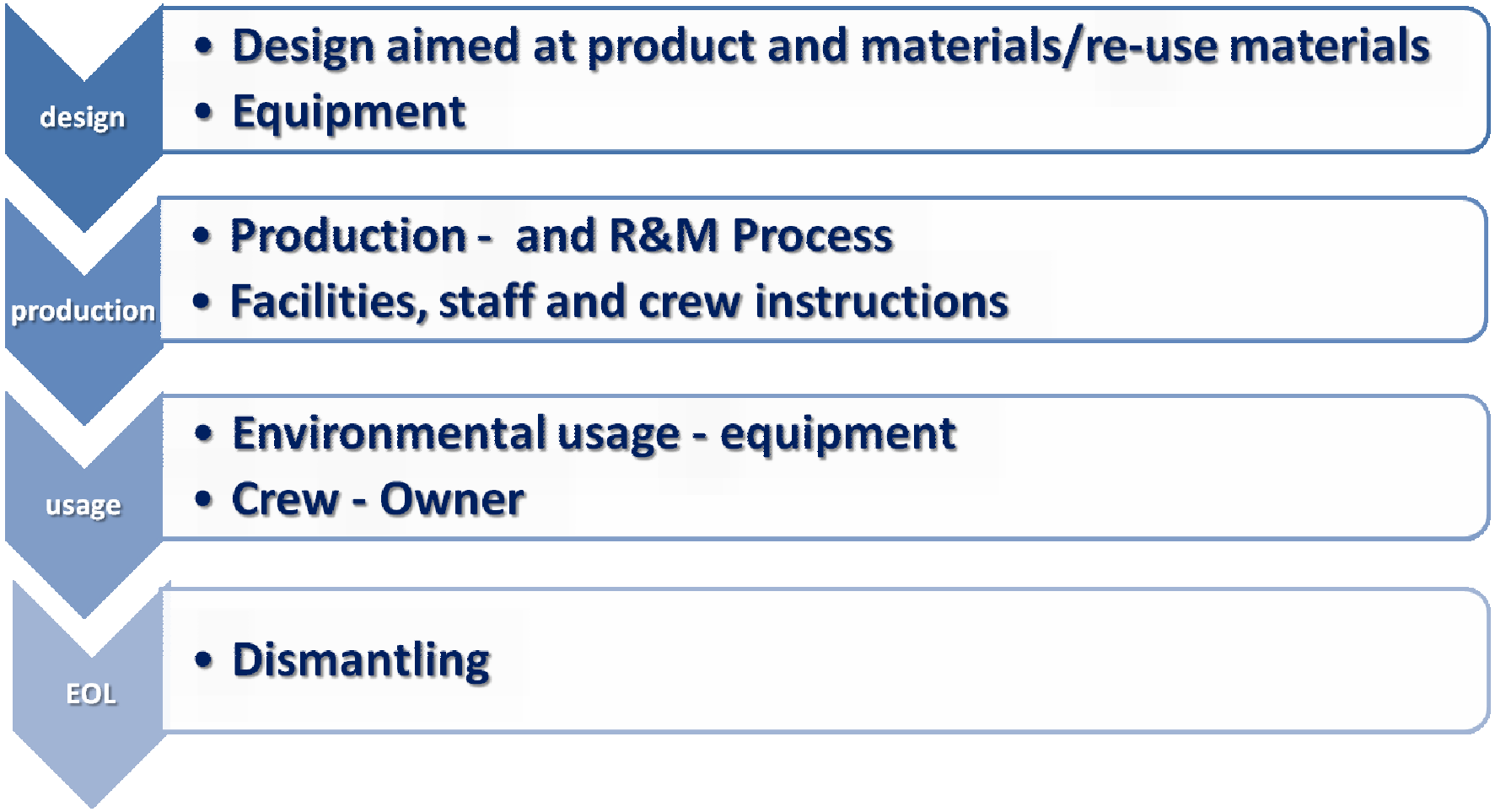
Lifecycle Approach



.....E A TERRA ????.....

- ISO 14001
- EMAS (Reg. CE761/01)
- Altri schemi volontari


GRAZIE PER L'ATTENZIONE