

Marine Shipping Solutions Workshop

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Overview

- POLA Environmental Ship Index (ESI) Incentive Program
- VSR
- Emission Reduction Technologies
- SBCAPCD Open Incentive Discussion

Environmental Ship Index (ESI)

- ❑ International clean ship indexing program

- Web-based tool

- ❑ Assigns scores to vessels performing better than IMO rules

- Before regulations

- Beyond regulations



- ❑ Focus on priority pollutants

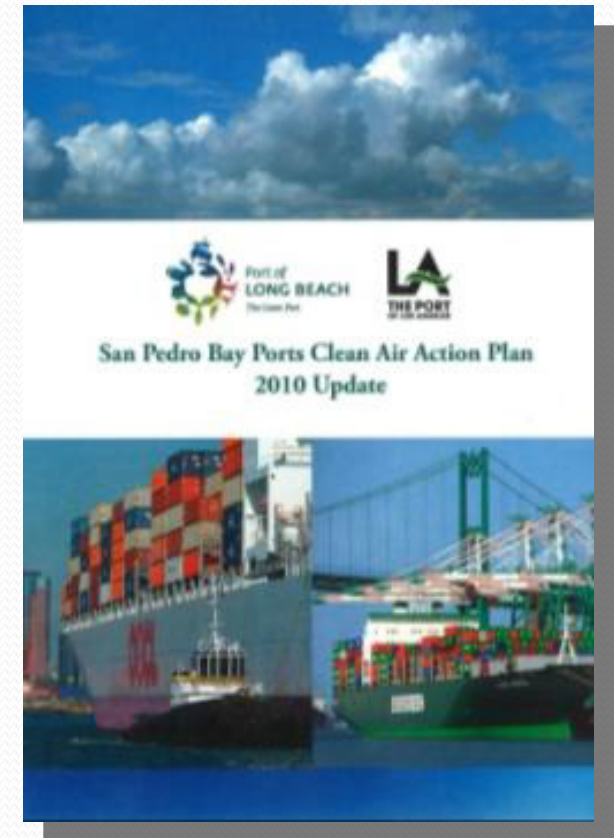
- GHG reductions in the future

- ❑ Standard for ports to reward clean ships



Why Important to POLA?

- ❑ Promote internationally-accepted indexing system
- ❑ Contribute to CAAP goals
 - Standards
 - OGV 5 & 6
- ❑ Reward early action readiness for upcoming regulations
- ❑ Lead as North American catalyst
 - Incentives from multiple ports increases industry participation



Why Important to Industry?

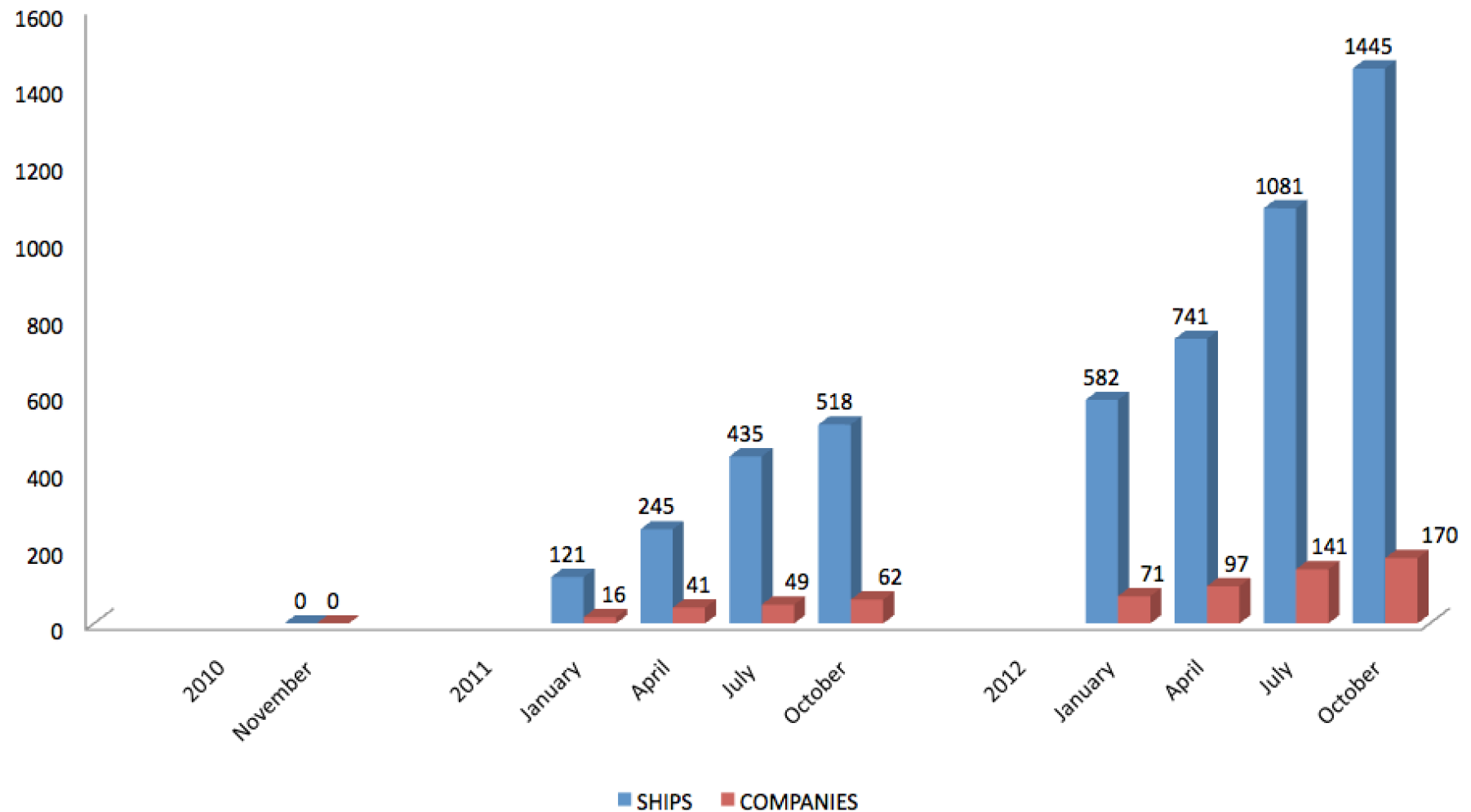
- ❑ Participate in an internationally-accepted indexing system
- ❑ Recognition & rewarded for early action readiness for upcoming regulations
- ❑ Incentives from multiple ports



ESI, Who is Participating?

- ❑ 1,445 vessels enrolled
- ❑ 170 shipping lines are participating
- ❑ 16 ports offering incentives
- ❑ Five container lines calling the Port are participating in ESI
- ❑ In 2011, 12 vessels made 135 calls to the Port
- ❑ Two North American Ports will join ESI in 2012

ESI, Who is Participating?



ESI Incentive Providers



Port of Los Angeles
Autorità Portuale di Civitavecchia
Brunsbüttel Ports GmbH
Green Award Foundation
Groningen-Seaports
Hamburg Port Authority
Port of Amsterdam
Port of Antwerp
Port of Ashdod
Ports of Bremen/Bremerhaven
Port of La Havre
Port of Oslo
Port of Rotterdam
Port of Zeebrugge
SEEHFEN KIEL GmbH & Co. KG
Tata Steel IJmuiden Terminals

Port of Los Angeles Environmental Ship Index Program

Environmental Ship Index Incentive

\$1,250

• ESI Score 40+
per call

\$1,000

• ESI Score 35-39
per call

\$750

• ESI Score 30-34
per call

\$250

• ESI Score 25-29
(7/1/12-12/31/12)
per call



Additive Incentive Opportunities - OGV5 & 6

\$3,250

• Vessel with IMO Tier 3 Main Engine
per call

\$750

• Vessel with IMO Tier 2 Main Engine
per call

**OGV5 –
Cleaner
Engines**

\$750

• Main Engine Demo Participation
per call

**OGV6 –Engine Emissions
Reduction Technology
Improvements**

Environmental Ship Index (<http://esi.wpci.nl>)
and

Port of Los Angeles Incentive Payment
(<http://www.portoflosangeles.org/environment/ogv.asp>)

Registration

Clean Ship Profile

Vessel Particulars	ESI 25-29	ESI 30-34	ESI 35-39	ESI 40+
Engine rating lower than Tier I engine for NO _x	✓	✓	✓	✓
Lower sulfur than regulation Heavy Fuel Oil (HFO)	✓	✓	✓	✓
Lower sulfur than regulation Marine Gas Oil/Diesel Oil (MGO/MDO)	✓			
Cleanest available MGO/MDO		✓	✓	✓
Ship Energy Efficiency Management Plan			✓ and/or	✓
Shore power technology on-board			✓	✓

Los Angeles Harbor Department Incentive Payment Schedule

☐ Quarterly Payments

✓ 7/1 – 9/30*

✓ 10/1-12/31

✓ 1/1 – 3/31

✓ 4/1 – 6/30

* On a one-time basis only for the first quarter of the program, the Harbor Department will pay incentives for qualifying ship calls from July 1, 2012 to September 30, 2012, provided the vessel operator is both registered for ESI and enrolled with the Harbor Department by September 30, 2012.

ESI, Point Accumulation

- ❑ 200 NOx points
- ❑ 100 SOx points
- ❑ 10 CO2 points
- ❑ 35 On-Shore Power Supply



ESI, NOx Points

- ✓ Provide basic engine data to accumulate NOx points

Main & Auxiliary Engines
200 NOx Points Possible

Provide Engine Data

- kW rating of engines
- Max RPM
- NOx engine rating

Accrue NOx Points

- > IMO Tier I Standard
- IMO Tier I Standard is 17.1 g-NOx/kW-hr

EIAPP

- IMO Standard vs. Engine Certification

g-NOx/kW-hr

17.1 = 0 NOx pts.

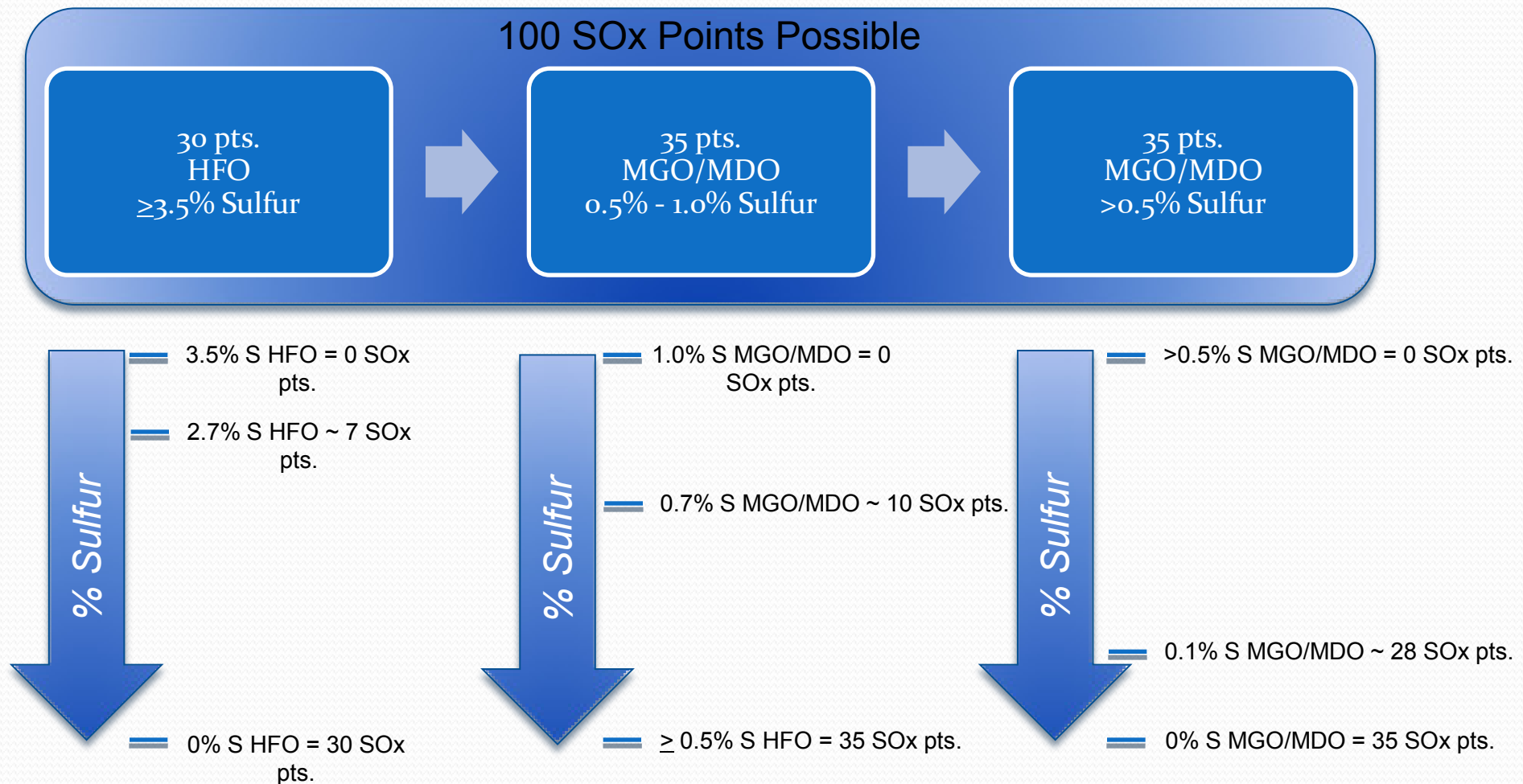
14.5 ~ 30 NOx pts.

8.55 ~ 100 NOx pts.

0 = 200 NOx pts.

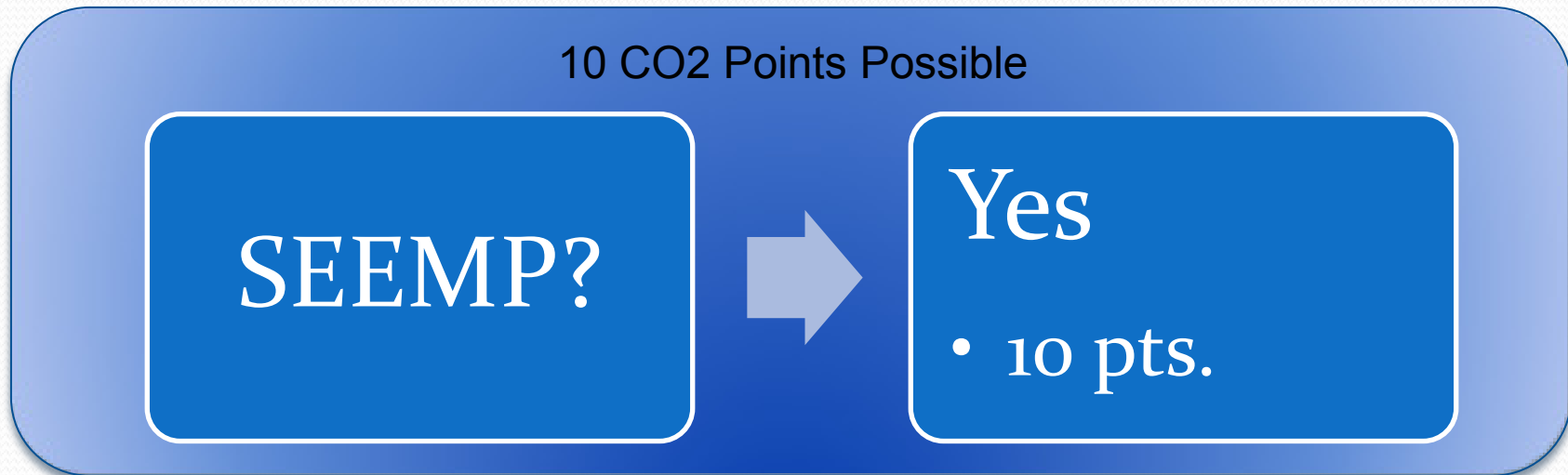
ESI, SOx Points

✓ Provide bunker note delivery receipts for heavy fuel oil (HFO) & marine gas oil/marine diesel oil (MGO/MDO) to accumulate SOx points



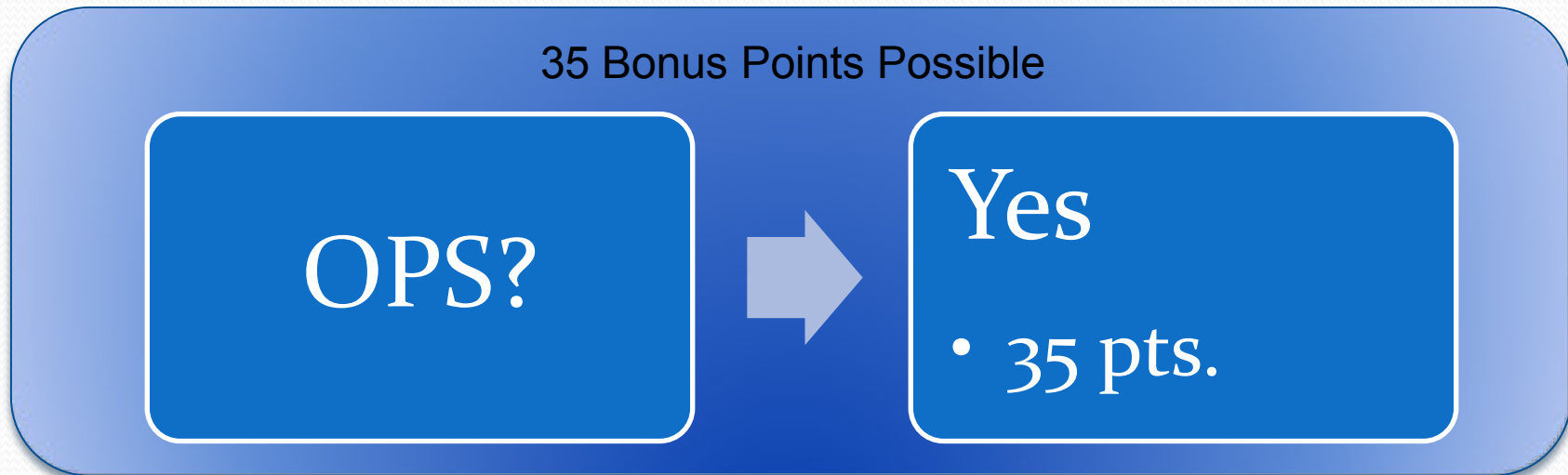
ESI, CO2 Points

- ✓ If the vessel has a Ship Energy Efficiency Management Plan (SEEMP) then vessel accumulates 10 CO2 points

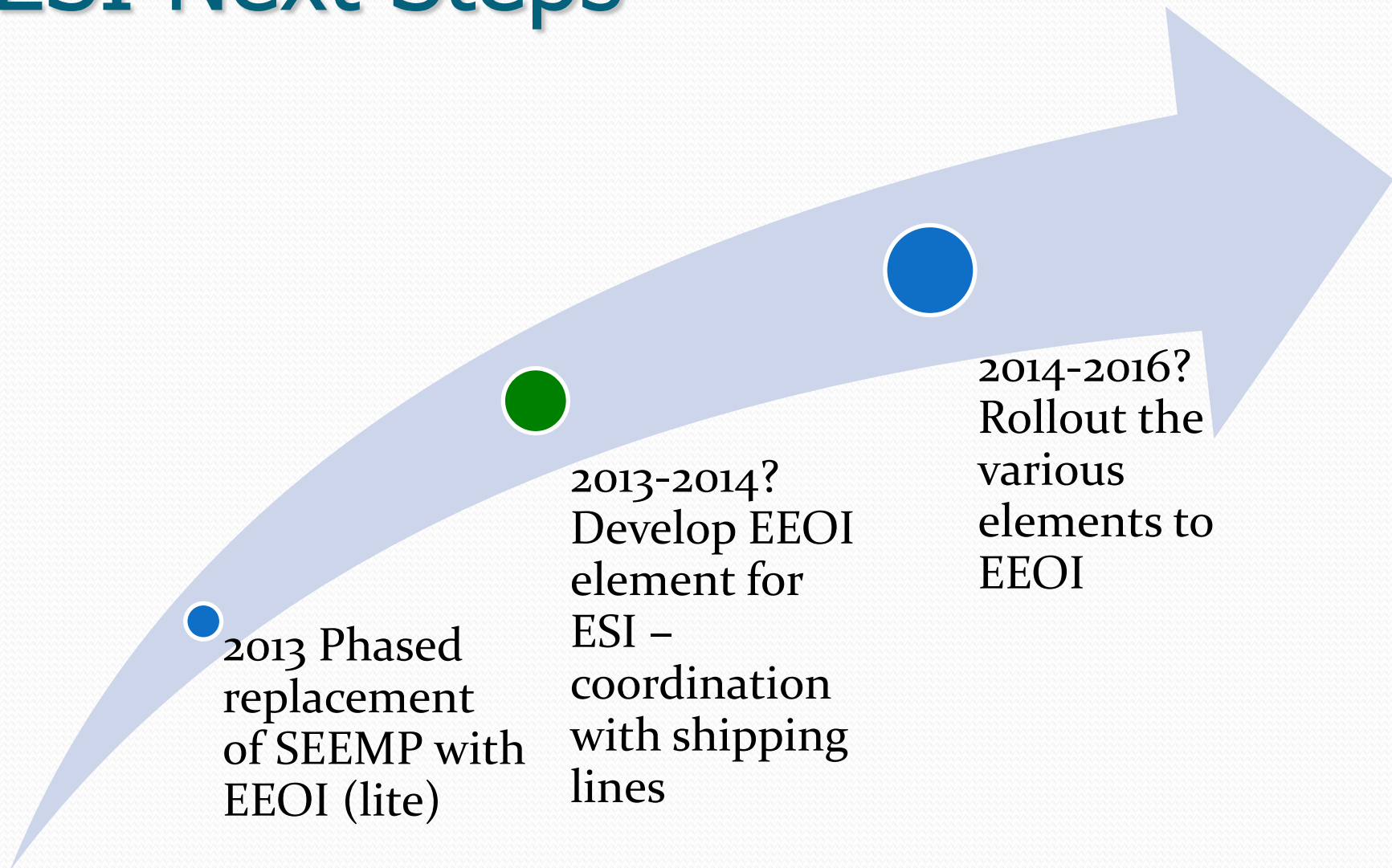


ESI, Bonus Points

- ✓ If vessel is has onshore power supply (OPS) on-board vessel, vessel receives 35 bonus points



ESI Next Steps



Environmental Ship Index: <http://esi.wpci.nl>
Port of Los Angeles: <http://www.portoflosangeles.org/environment/ogv.asp>

Vessel Speed Reduction (VSR)

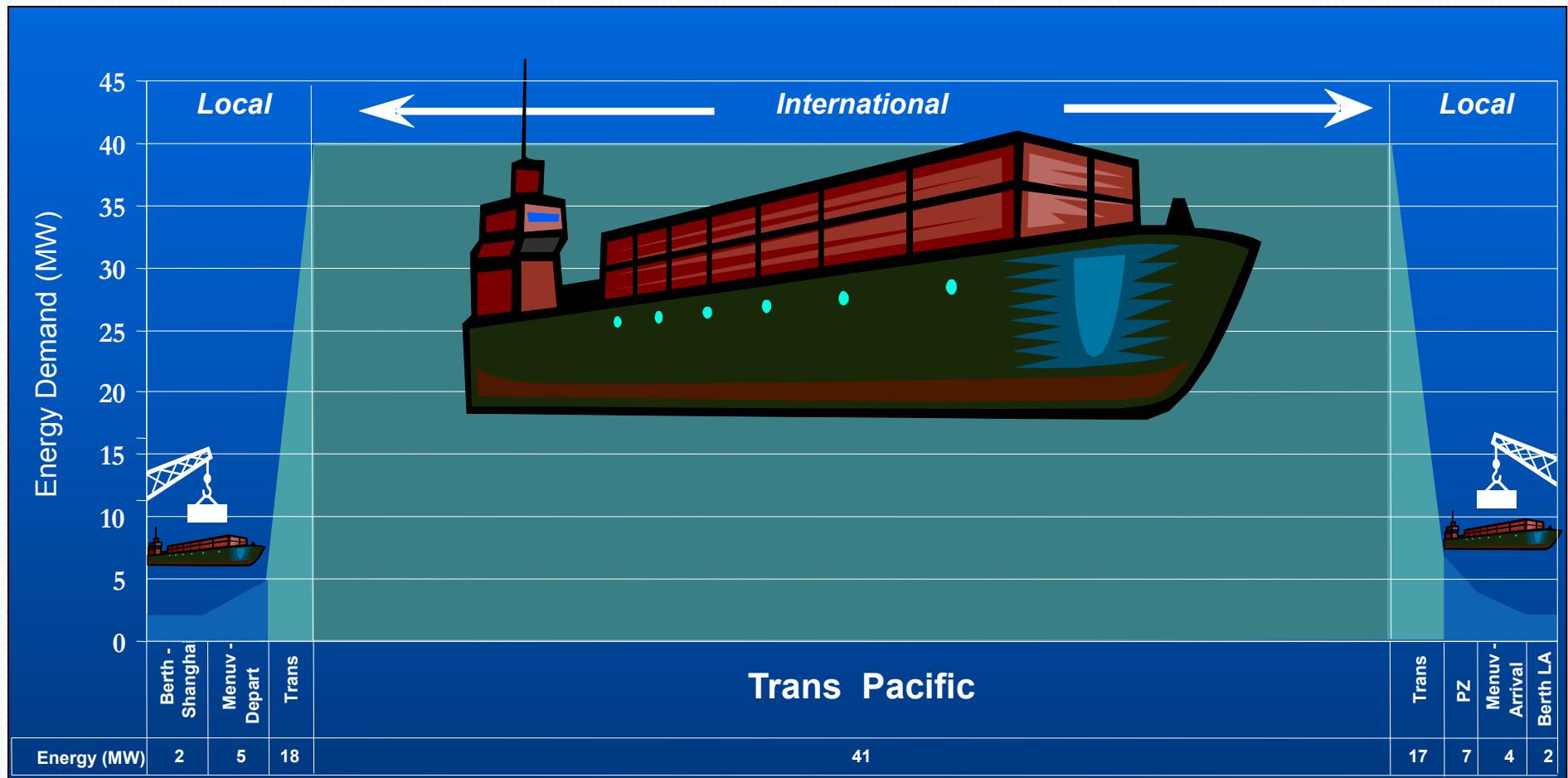
- One of Many Options for Reducing Ship Emissions
 - Fuel Switch
 - On-Shore Power
 - Vessel Speed Reduction (VSR)
 - Emission Reduction Technologies
 - Energy Efficiency Measures
 - ...
- Pollutant Consideration & Effectiveness
 - Port Domain Perspective
 - NO_x , $\text{PM}_{2.5}$, PM_{10} , DPM, & SO_x – Good Option for Reducing Regional & Local Health-Based Emissions/Impacts

VSR 101

- Advantages of VSR
 - Reduces all pollutants
 - All ships can do it
 - Short implementation time frame
 - Utilizing AIS data a program can be verified
 - Administration of VSR compliance can mostly be automated (POLA, POLB, PANYNJ, etc) = low administrative support costs
 - Reductions have been studied & estimating methods CARB & EPA accepted

VSR 101

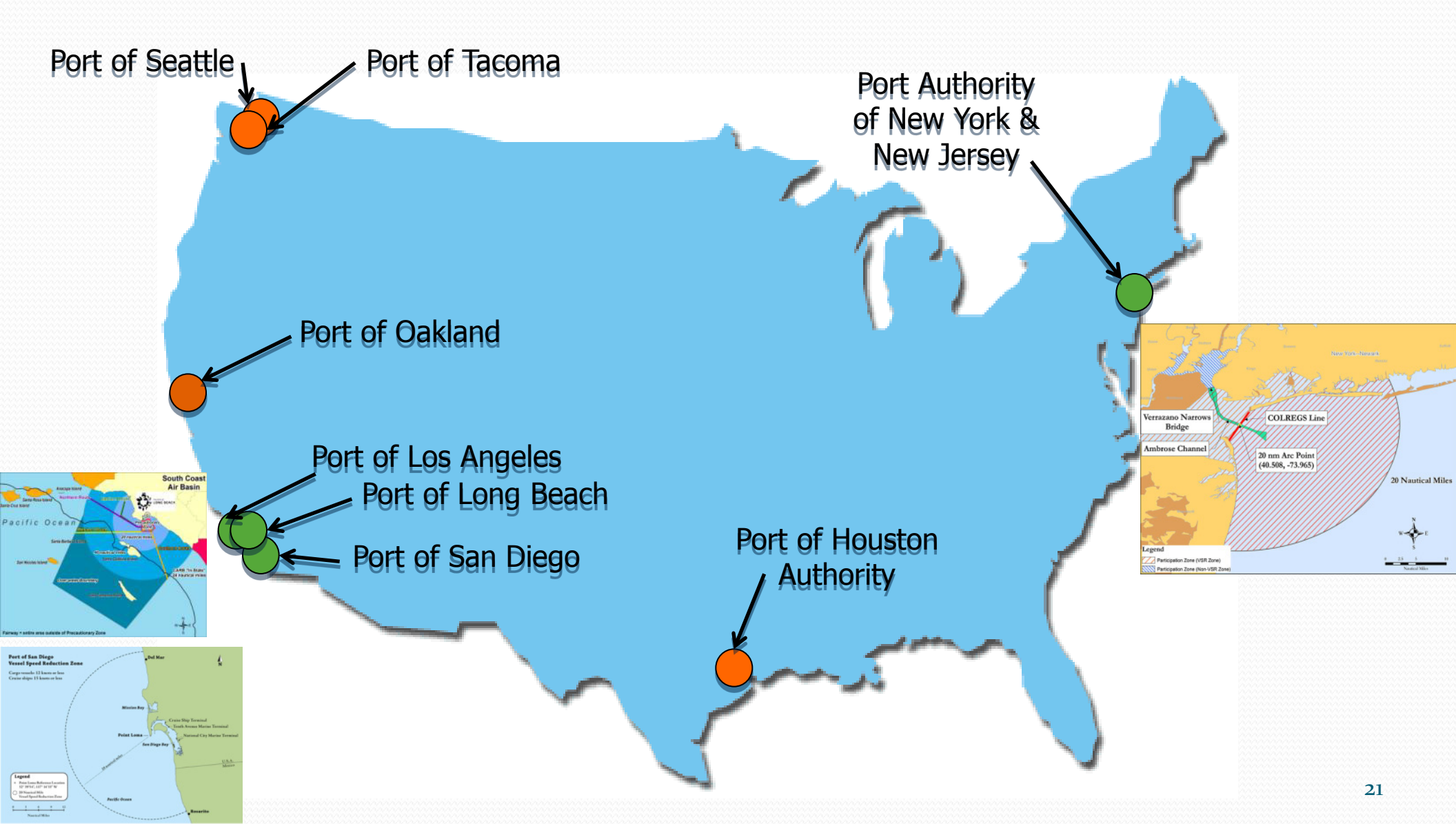
Ship Energy Profile



Factors Influencing Magnitude of Benefits

- Geographical Domain & Geography
 - Reduction Magnitudes from Slow Steaming Varies by Port
 - Coastal Ports – Good Potential to Reduce Open-Water Portion of Ship Transit Emissions
 - Limited by Geography & Domain Extent
 - Limited by Transitional Areas
 - Inland Ports – Limited Effect on Constrained Waterway Transit Emissions
 - Vessel Safety is Paramount
 - Speed Typically Already Reduced Due to Constrained Waterways
 - Pilot Time Limits
- Vessel Related Factors
 - Average Speeds Prior to Program Start
 - Large Auxiliary Loads are Primary Constraining Factor
 - Fleet Mix & Next Port

Port	Driver	Evaluated	Active	Start	Distance	Implmn.	Innovations/Challenges/Barriers to Implementation
		VSR Program?	VSR Program?				
Port of Los Angeles	NOx/DPM			2001	20/40	Vol/Inc	Dockside work gang assignment moved to VSR boundaries
Port of Long Beach	NOx/DPM			2001	20/40	Vol/Inc	Marine exchange/USCG participation; Green Flag Program
Port San Diego	NOx			2009	20	Vol/Inc	Set Cruiseship Speed to 15 knots & all others 12 knots
Port of Oakland	NOx						Ships already slow to 10 knots @ Bay Bridge; Strong currents
Port of Seattle	PM						Ships gradually slow naturally; Added costs; Strong currents
Port of Tacoma	PM						Ships gradually slow naturally; Added costs; Strong currents
Port Authority of NY & NJ	NOx			2010	20	Vol/Inc	Set VSR speed limit to match right whale
Port of Houston Authority	NOx						Ships in nonattainment area already constrained by ship channel



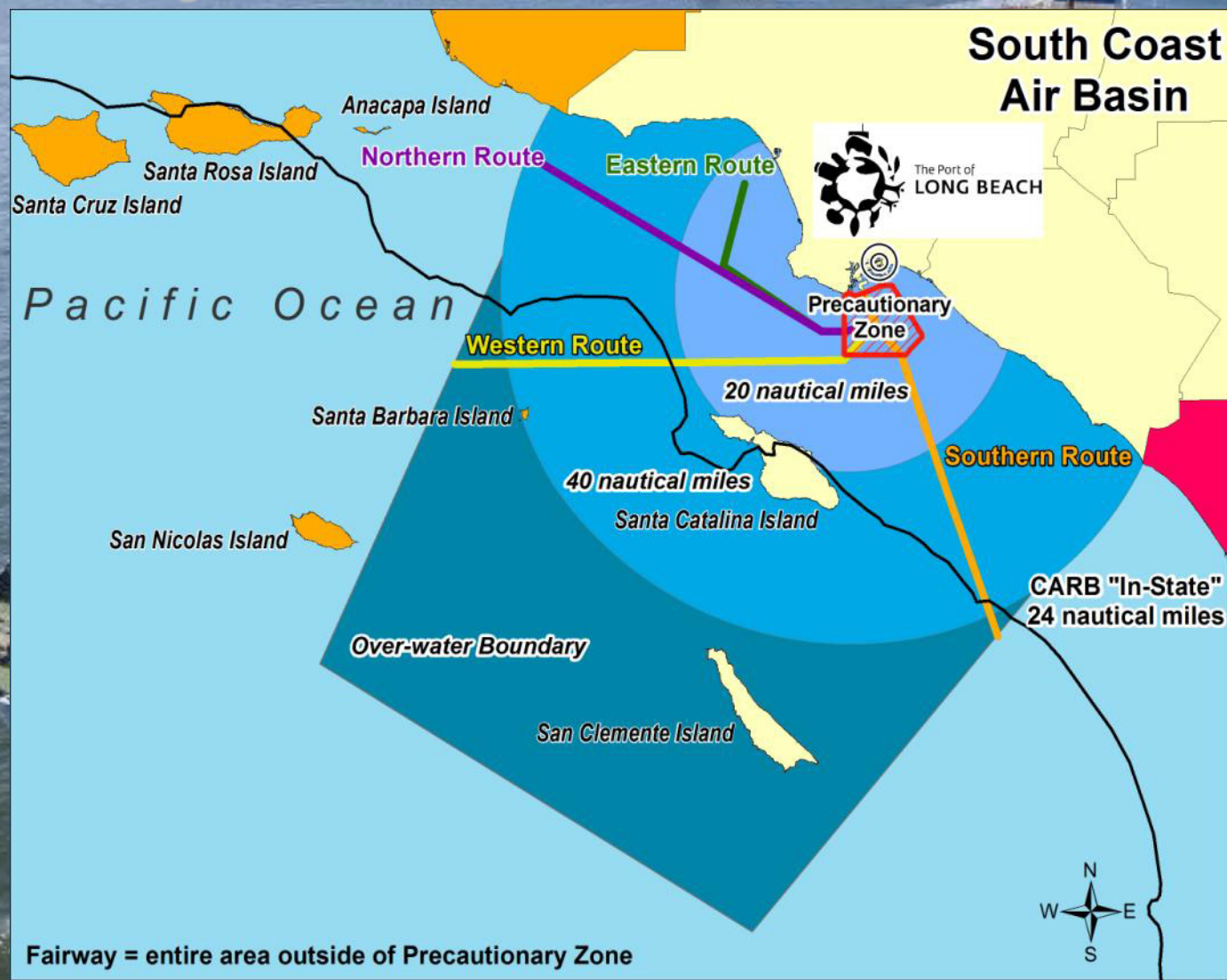
VSR Example

- San Pedro Bay Ports (SPBP) Developed First VSR Program
 - Implementation Date: October 2001
 - Implementation Approach: Voluntary/Incentive
 - Status: Ongoing
 - Vessel Types: All
 - Drivers
 - Extreme NOx Nonattainment
 - Coastal Ports w/Beneficial Geographical Domain
 - Public, Regulatory, & Board Pressure to Reduce NOx
 - Participants in Development of Program:
 - Port of Los Angeles (POLA)
 - Port of Long Beach (POLB)
 - Marine Exchange
 - US Coast Guard
 - California Air Resources Board (CARB)
 - South Coast Air Quality Management District
 - Pacific Merchants Shipping Association (PMSA)



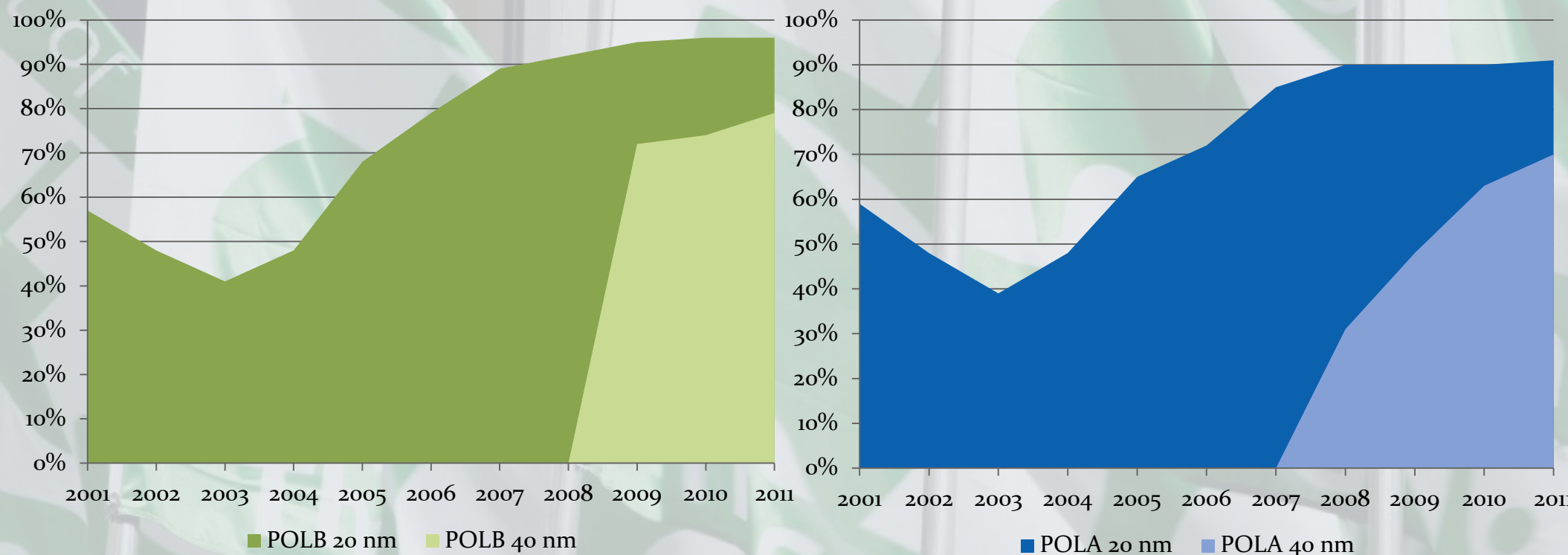
VSR Example

- SPBP VSR Program
 - VSR Program Domain



VSR Example

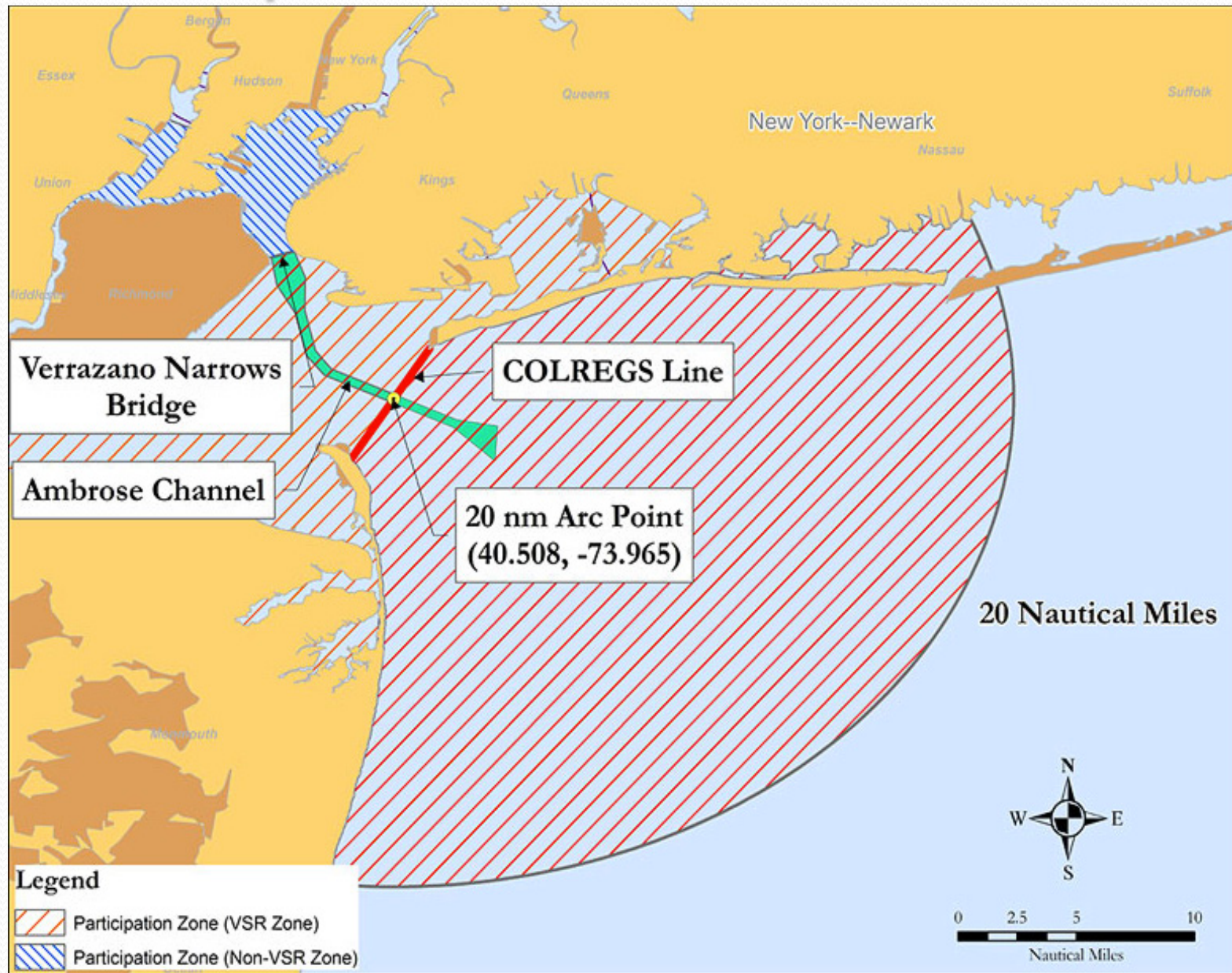
- SPBP Vessel Speed Reduction (VSR) Program –
 - Compliance History



VSR Examples



VSR Examples



VSR Examples



Emission Reduction Technologies



San Pedro Bay Ports Clean Air Action Plan
Guide to OGV Emission Control Strategies

January 2012



□ Clean Air Action Plan

- Technology Advancement Program
- Emission Inventory Improvement
- OGV 6 Measure

www.cleanairactionplan.org/default.asp

SBCAPCD Incentive Open Discussion



Thank You!



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