Improving the Energy Efficiency of Existing Ships

Individual Ship Performance Indicator
(ISPI)

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Key Messages

- **Support the development of Technical and Operational measures to increase ships' Energy Efficiency**

- **Based on a phased approach, establish a standard addressing individual ships but including the existing fleet**

- **At DG MOVE request, EMSA developed one of the options currently under discussion - the *ISPI***

- ***It is a concept! Informally put together to see how things could go forward as the EC is committed to advance in the IMO with both the MRV and an Energy Efficiency measure***

- **The Industry, being invited to constructively engage in the discussions, is sharing views/concerns to understand:**
  - **1) the practicalities of the shipping business**
  - **2) barriers to uptake EE measures**

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The Main Objectives

- **Build on sufficiently accurate, simple and available concepts**
- **Applied to existing ships of the EEDI type categories**
- **Avoid putting an emission cap, allowing activity growth and maintaining market differentiation**
- **Achieve short-term significant CO_2 reductions**
- **Focus on the overall efficiency of a ship i.e. accounting for *technical/design efficiency* and *operational performance***
- **Ship-specific efficiency improvements reachable through both *technical* and *operational* measures**
- **Data requirements: Fuel Type & Consumption and Distance**

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On the Technical/Design Efficiency

- **The EIV regression curves (i.e. reference lines used for the EEDI) in Res.MEPC.215(63) represent a fair image of the existing fleet w.r.t. its standard technical/design efficiency**

- **EIV of ships built between 1999-2009 are available**

- **Ships' EIV are to be calculated (before 1999 and after 2009)**

- ***Energy Efficiency Standard Value EESV* are available (curve)**

- **Ship-specific *Efficiency Design Variance Vc***

$$Vc = (EIV/EESV)$$

Each ships will have its Vc to understand how well it is positioned, in terms of design/technical efficiency, amongst its category (type&size)

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On the Operational Performance

- **Shipping will always aim to be as cargo efficient as possible**
- ***CO_2 efficiency standard*** **(gCO_2/n-mile), reflecting ship's operational performance**

Establishing the Combined Formula

- ***Efficiency Improvement Target EIT*****, in terms of reduction of CO_2 per nautical mile travelled**

$$EIT = \left(\frac{Fc \times Cf}{D}\right) \cdot (Y \times Vc) \qquad \frac{gCO_2}{n\,mile}$$

MEPC would set improvements **Y (%)**, corrected by the appropriate **Vc (i.e. DF %)** and applied to ship-specific operational reference value. Ships shall meet the required ***Efficiency Indicator*** by means of operational and/or technical measures as deemed appropriate

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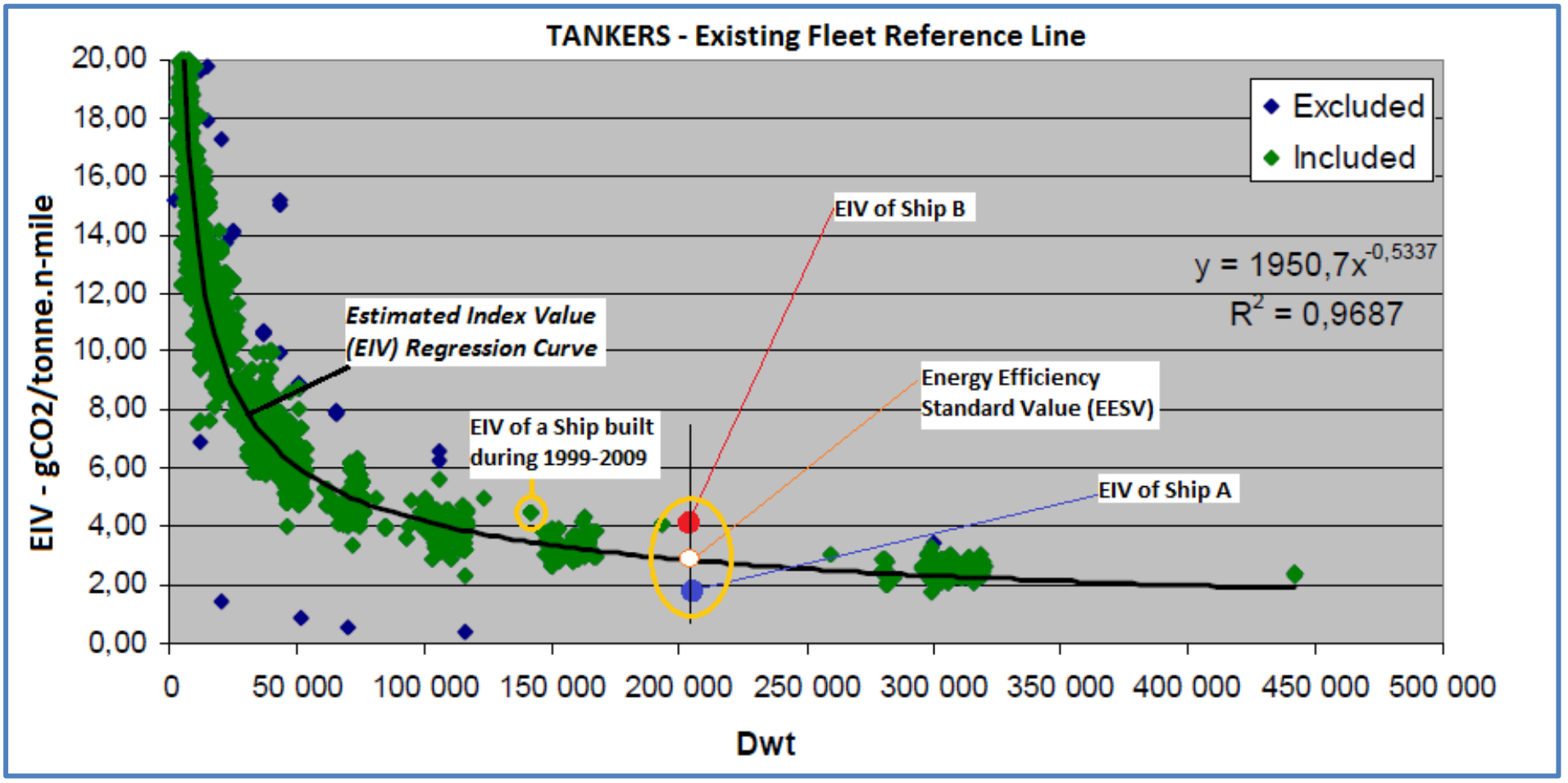

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The Example

- **Vessel A operational performance value = 8 Kg CO2/n-mile**
- **Vessel B operational performance value = 10 Kg CO2/n-mile**

10% improvement is foreseen over certain time period

Vessel A will have to lower 7% (corresponds to Vc of 0.7 - being 30% below the curve), therefore improve by an *efficiency indicator of 0.56 (Kg CO_2/n-mile)* i.e. reducing 560 grs CO_2 per n-mile.

EIT = (**8** Kg CO_2/n-mile) x (**10%** x **0.7**) = (**8** Kg CO_2/n-mile) x (**7%**) = **0.56** Kg CO_2/n-mile

Vessel B will have to lower 13% (corresponds to Vc of 1.3 - being 30% above the curve), therefore to improve by an *efficiency indicator of 1.3 (Kg CO_2/n-mile)* i.e. reducing 1.3 Kg CO_2 per n-mile.

EIT = (**10** Kg CO_2/n-mile) x (**10%** x **1.3**) = (**10** Kg CO_2/n-mile) x (**13%**) = **1.3** Kg CO_2/n-mile