HBI C-Flex

iima International Iron Metallics Association

IIMA

Regulatory background

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AGENDA

1. IIMA introduction
2. Genesis of HBI C-Flex
3. Regulatory background
4. Key takeaways

Co-funded by the European Union – GA n. 101092168

Source picture: https://mitsteel.com/service/hot-briquetted-iron-hbi/

About IIMA

A unified voice for the ore-based metallics industry

Communication

Getting the right messages to our stakeholders

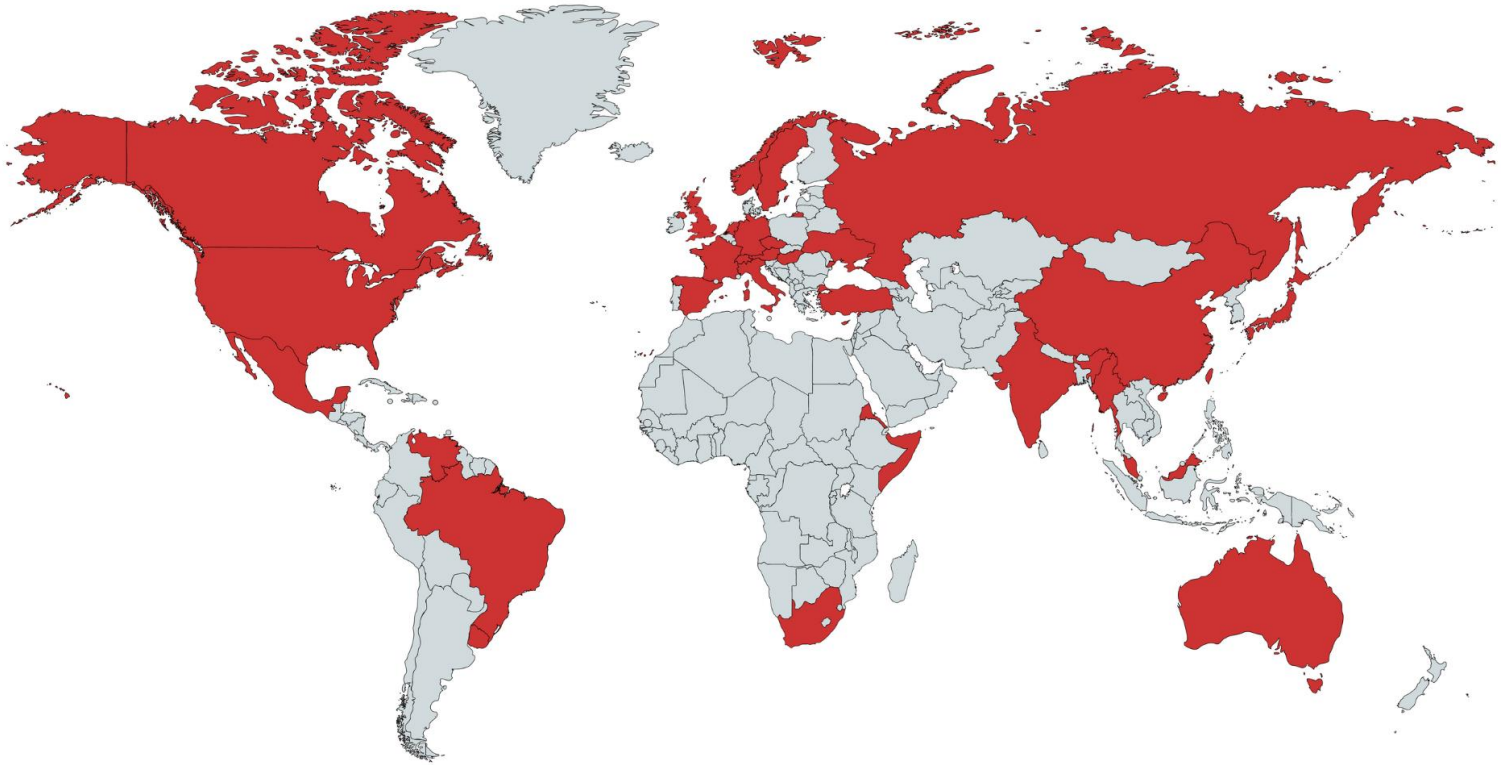
Product & Market Support

Product information & guides
Value-in-use model
Educational workshops & webinars

Regulatory Support

Chemical industry regulation (e.g. REACH)
Maritime regulation
Product stewardship

IIMA members



A list of IIMA members can be found on our website

Producers, Traders and Distributors of merchant pig iron, hot briquetted iron, direct reduced iron and related materials

Companies associated with the ore-based metallics industry, but not as Producers, Traders or Distributors

- consumers of ore-based metallics
- technology and equipment suppliers
- iron ore producers
- shipping and logistics providers
- providers of consultancy services
- metallics project developer

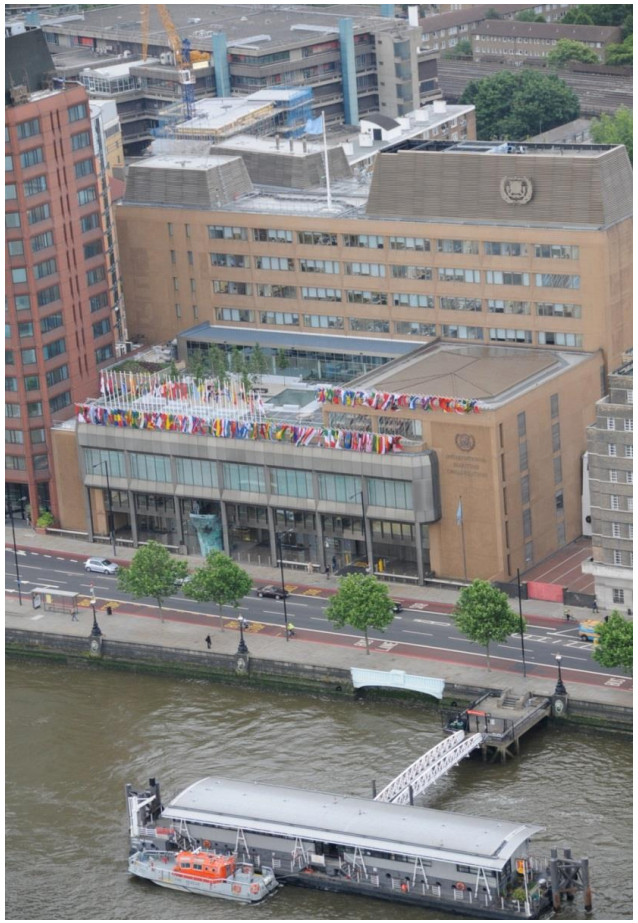
Individuals who have contributed significantly to the industry

Genesis of HBI C-Flex: the triggers

HBI C-Flex iima

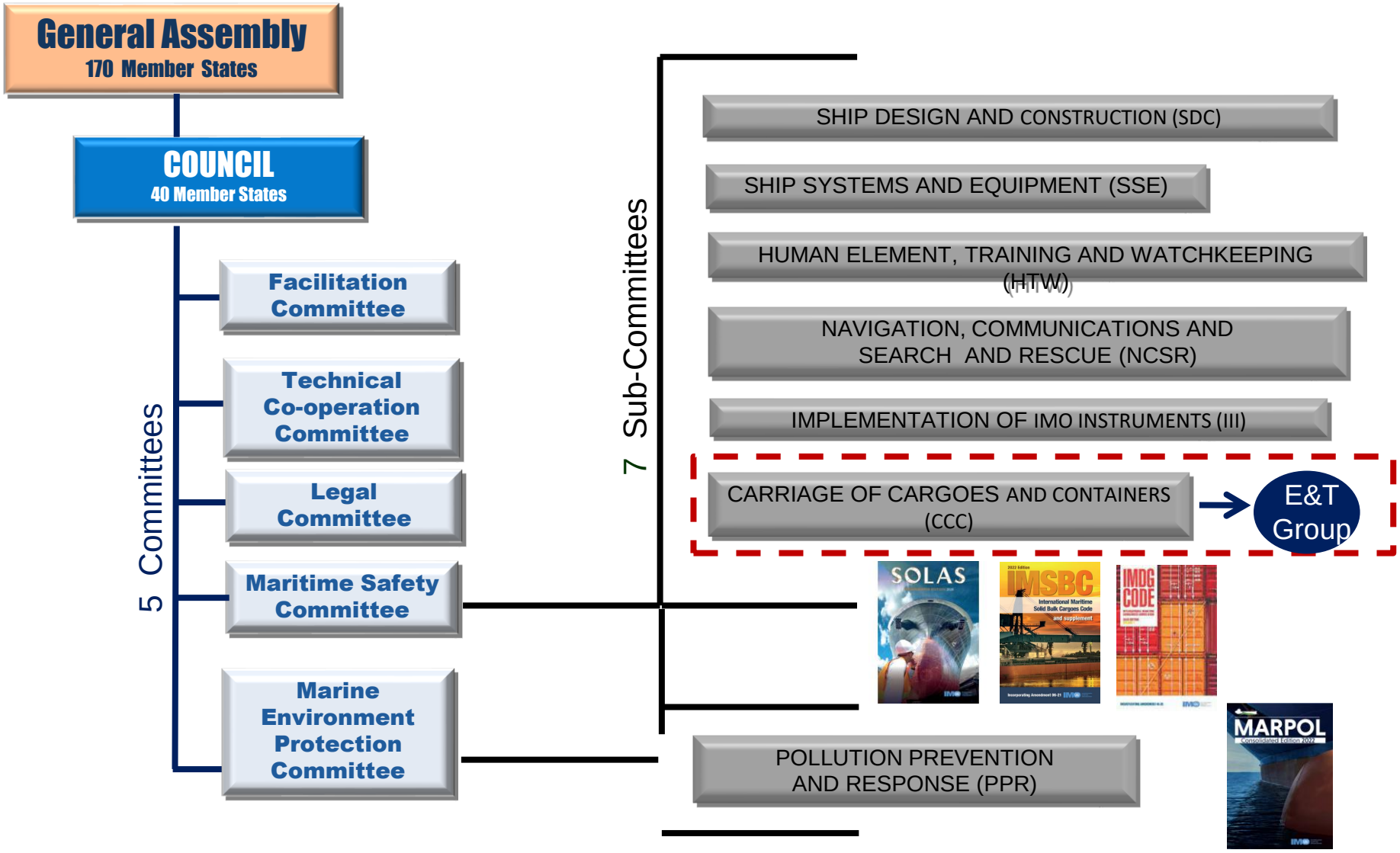
- **IMSBC Code description of HBI**: apparent density > 5,000 kg/m^3
- **Apparent lack of empirical scientific basis for this value** – a case of applied science with a practical outcome
- **Plans by Cleveland Cliffs to offer HBI customers a range of carbon contents from the Toledo HBI plant**, including up to 3.5-4% (compared to typical value of 0.5-1.6%)
- **Carbon-neutral steelmaking and the transition from BF/BOF to DR/EAF**
  - Hydrogen-based DRI/HBI
  - DRI/HBI produced from BF grade rather than DR/EAF grade pellets

International Maritime Organisation



- IMO is an intergovernmental body that deals with matters on **sea transport**, which are referred to it by its Member Governments.
- IMO is mainly involved in development of international regulations, on the basis of proposals by Member Governments.
- The practical design and application is the responsibility of the maritime Administrations concerned

IMO structure & organisation



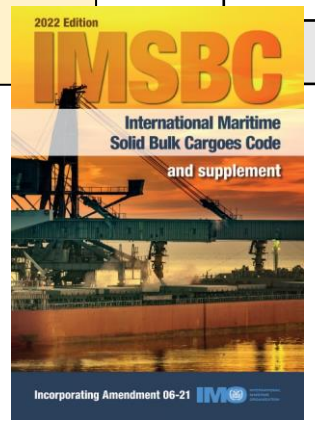
Hazard classification of solid bulk cargoes

Group A consists of cargoes which may liquefy if shipped at a moisture content in excess of their transportable moisture limit.

Group B consists of cargoes which possess a chemical hazard which could give rise to a dangerous situation on a ship.

Group C consists of cargoes which are neither liable to liquefy (group A) nor to possess chemical hazards (group B).

MHB Hazards	
Chemical Hazard	**Notation**
Combustible solids	CB
Self-heating solids	SH
Solids that evolve flammable gas when wet	WF
Solids that evolve toxic gas when wet	WT
Toxic solids	TX
Corrosive solids	CR
Other hazards	OH
MHB = Material Hazardous only in Bulk	



IMSBC Code and DRI

IMSBC Code schedules for DRI:

Direct Reduced Iron (A) Briquettes, hot-moulded (this is HBI and is Group B)

Direct Reduced Iron (B) Lumps, pellets, cold-moulded briquettes (this is DRI and is Group B)

Direct Reduced Iron (C) (By-product fines)* (this is DRI/HBI Fines and is Group B)

All three are MHB SH and/or WF

*DRI (C) specifies moisture 0.3% maximum and will be supplemented from 2025 by a new schedule DRI (D) for “DRI Fines with moisture of at least 2%” which will be Group A and B.

DRI (A) Schedule (=HBI)

Description

Direct reduced iron (DRI) (A) is a metallic grey material, moulded in a briquette form, emanating from a densification process whereby the DRI feed material is moulded at a temperature greater than 650°C and has a density greater than 5,000 kg/m³. Fines and small particles (under 6.35 mm) shall not exceed 5% by weight.

Characteristics

Physical properties			
Size	**Angle of repose**	**Bulk density (kg/m³)**	**Stowage factor (m³/t)**
Approximate size: Length 50 mm to 140 mm Width 40 mm to 100 mm Thickness 20 mm to 50 mm Briquette weight 0.2 to 3.0 kg Fines and small particles: under 6.35 mm	Not applicable	2,500 to 3,300	0.30 to 0.40 To be verified by the shipper
Hazard classification			
Class	**Subsidiary hazard(s)**	**MHB**	**Group**
Not applicable	Not applicable	SH and/or WF	B

Other requirements under **Loading** section:

- moisture content <1%
- cargo to be composed of essentially whole briquettes

Key takeaways

- The volume of HBI transported by sea can be expected to grow significantly in the coming decades (in 2022 international trade in DRI/HBI was ~8 mt)

- Compliance with maritime regulations:
  - safety of crew, vessel and cargo
  - in effect a licence to transport by sea

- Industry practice and maritime regulation must keep pace with each other:
  - DRI still has a high profile at the IMO due to past incidents – regulators have long memories
  - applied science with a practical outcome is no longer sufficient for DRI
  - with its NGO consultative status at the IMO, IIMA has a seat at the table and has developed strong relationships with key regulators and other NGOs

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