



Tracking Industrial Energy Efficiency and CO₂ Emissions

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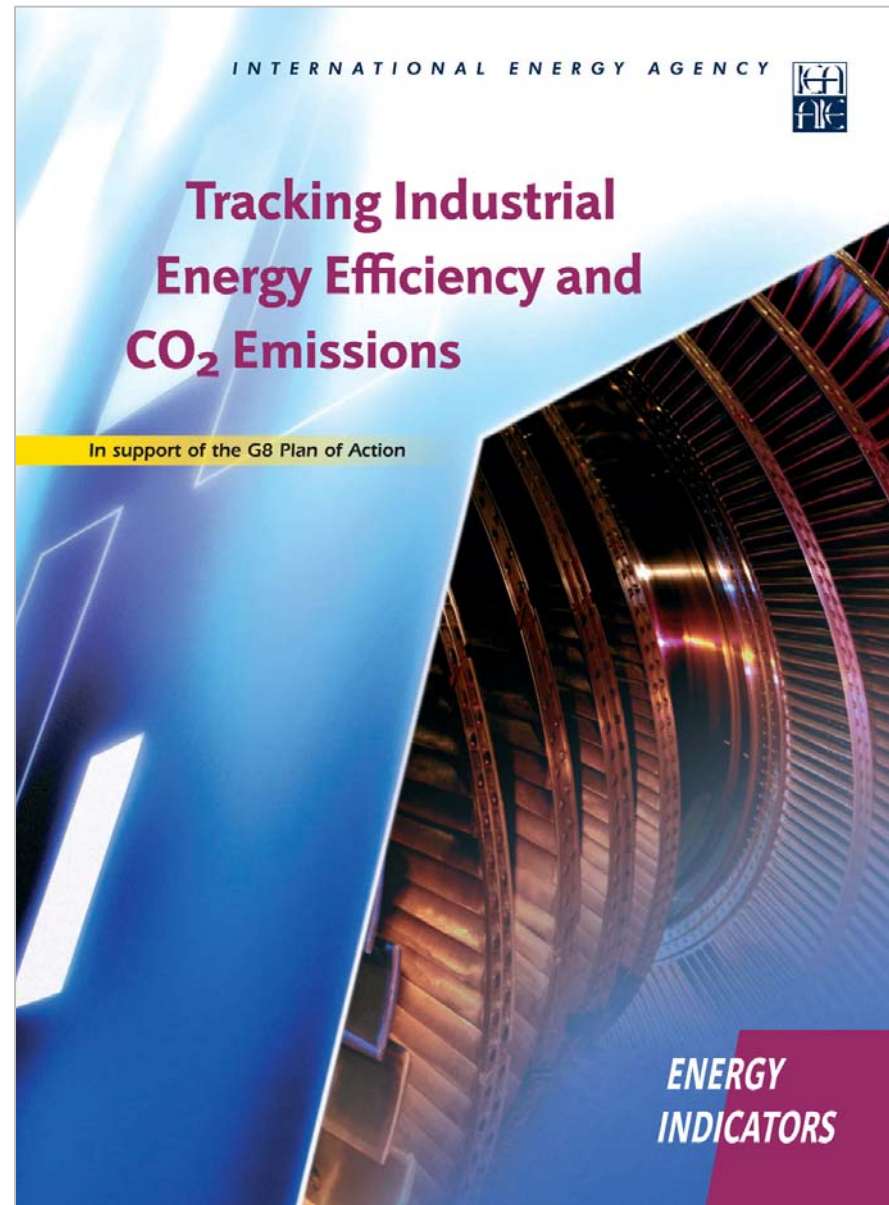
The Institutional Framework

- Increased Energy Efficiency is widely recognized as a desirable target (IEA ministerial, G8, APP,...)
- Indicators can help to monitor country progress and compare countries
- IEA secretariat has been asked by the Governing Board and G8 to develop indicators
- Energy efficiency and CO₂ intensity indicators
- G8 summit Japan July 2008: deliver the results of the Gleneagles programme

Industry Cooperation

- Co-operation with: APP, CEPI, CEFIC, IAI, IFA, IISI, ICFPA, FAO, WBCSD,...
- So far 9 workshops with industry
- Valuable insights and comments
- Proceedings and presentations are public: CDs and www.iea.org





Goals

- **Identify countries, sectors and technologies with significant improvement potential**
- **Develop indicators to do so**
- **Collect data to apply these indicators**

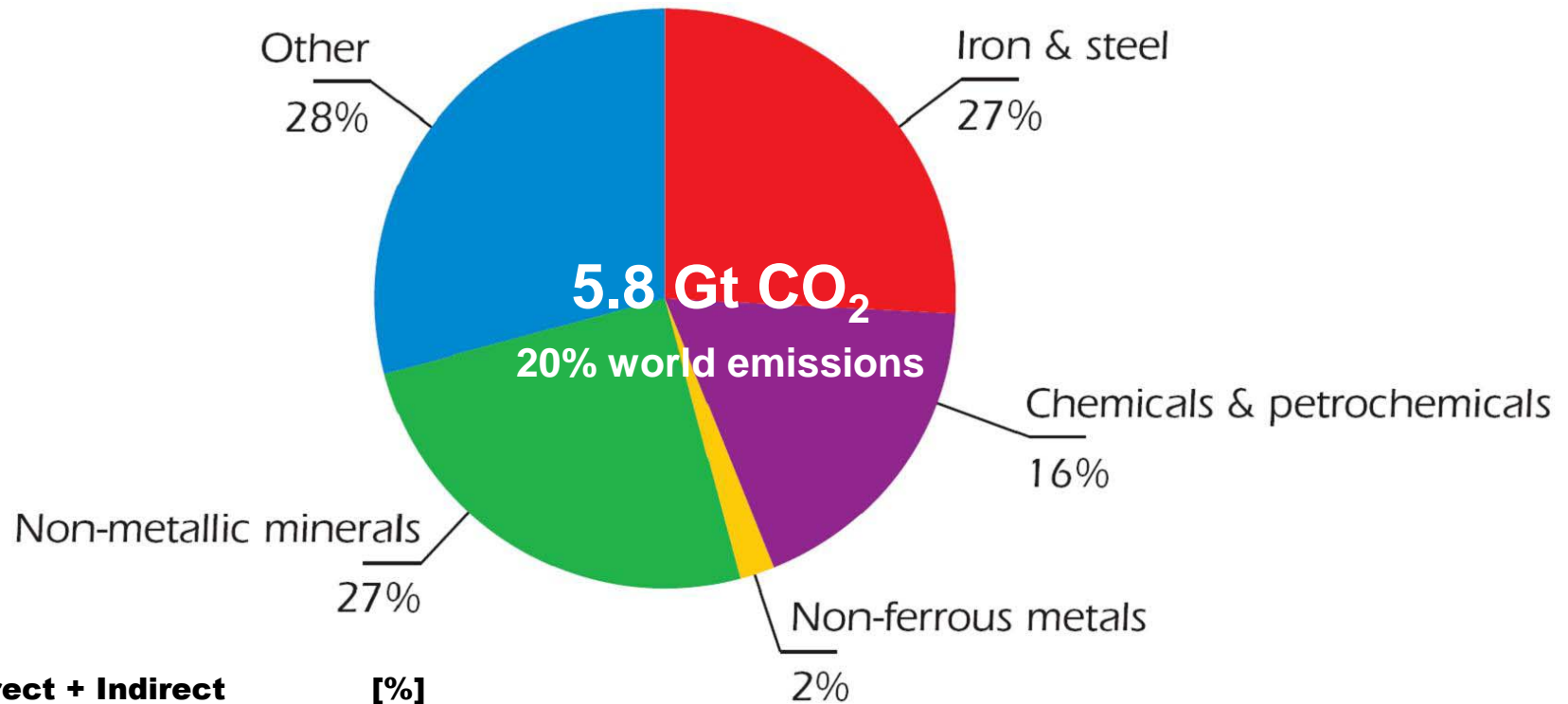
Industry Indicators - content

- Current efficiencies & past trends on a country or region level, by sector
- Focus on energy and CO₂ emissions per unit of *physical* product (tons)
- Proposes multiple indicators: there exists no “true” country ranking
- Based on indicators, assessment of realistic technical long term improvement potentials

New Methods

- Indicators complement benchmarking
- Each sector needs a tailor-made approach
- Data availability, methodological detail and acceptance must be balanced
- The indicators need more validation and refinement
- The new physical indicators will be integrated into the general IEA indicators set

Industrial Direct CO₂ Emissions, 2004



Direct + Indirect	[%]
Iron and steel	21.3
Chemicals and petrochemicals	16.7
Non-ferrous metals	5.2
Non-Metallic minerals	18.8
Other	38.0

D+I - 9.7 Gt CO₂
36% of world emissions

Sectors Considered for Indicators

- **Chemical and Petrochemicals**
- **Iron and Steel**
- **Cement**
- **Pulp and paper**
- **Aluminium**

Country Ranking

- The energy efficiency is generally high in Japan
- Country ranking differs by sector and process
- CO₂ intensity ranking and energy efficiency ranking often differ
- Resource endowment and capital stock age are important explaining factors
- The picture in developing countries is mixed
 - ◆ New capital stock is among the worlds most efficient
 - ◆ Small-scale operations are inefficient

Technological Improvement Potentials

	[EJ/yr]	[Mt CO ₂ /yr]
Sector Process improvements	12-17	1150-1550
Systems Options	13-20	750-1650
Total	25-37	1900-3200
Industrial Improvement potential	18-26%	19-32%
World Improvement potential	5-8%	7-12%

Main Insights

- Industry accounts for 36% of CO₂ emissions, mainly from primary materials production
- Energy intensive industry has made great strides in improving efficiency, but overall industrial energy use continues to grow strongly, particularly in the emerging economies
- A large energy efficiency potential remains and moving to best practice would save each year 1.9 to 3.2 Gt CO₂ (7-12% of total global emissions)
- Key areas for efficiency gains include chemicals, iron and steel, cement, motor systems, combined heat and power

Policy Messages

- **We need better information - indicators analysis must continue**
- **It is vital to modernise old/inefficient plants - including those in OECD countries**
- **New plant must use best available technology**
- **Optimise energy systems, including CHP, in all industry**
- **The task is urgent. Governments and industry must co-operate**

Next Step in Industry Analysis

- Further elaboration of indicators (refine indicators, more countries)
- Assess the potential of new technology for efficiency and CO₂ reduction
- Assess the economics of emissions reduction
- Develop sector-specific scenarios with technology and country-level detail
- Publication February 2008
- Summary chapter in Energy Technology Perspective 2008 (May 2008, input for G8)



Thank you !

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