# Metallinjalostajat

# Päästökauppadirektiivin uudistumisen vaikutukset teollisuuteen Suomessa –

## Innovation Fund (NER400)-rahaston hyödyntäminen

Kimmo Järvinen
Metallinjalostajat ry
6.6.2017 Sokos Hotel Presidentti

# Priority in the EU metal industry; low carbon projects 2017 to 2030

The European steel and metal industry is committed to contribute to the EU's climate objectives.

Steel production is a major source of global $CO_2$ emissions. 6% of global $CO_2$ emissions result from steel production. The EU steel industry's share is approximately [0.42]%. Global $CO_2$ emissions from steel production are set to increase significantly if no innovative technologies provide solutions.

Global steel production is forecasted to continue growth from 1.6 billion tonnes in 2016 (EU: 160 million tonnes) to 2 billion in 2030 and 2.7 billion in 2050. Primary steelmaking will be part of global steel production for decades to come until steel scrap can accommodate total global steel consumption.

The EU steel and metal industry is a world leader in $CO_2$ emission reductions and is today very close to the physical limits of conventional steelmaking technologies. Since 1970 the EU steel industry has reduced its total $CO_2$ emissions by 50%. Furthermore several studies have pointed out that steel is a $CO_2$ mitigation enabler through steel applications in energy, automotive and household. Currently, there is no steelmaking technology available in Europe nor in the world that could even come close to $CO_2$ emission reductions at the rate and pace necessary to achieve the target set out by the proposal for the fourth EU ETS trading period from 2021 to 2030 (43% by 2030 compared to 2005 levels with a linear reduction factor of 2.2% continuing thereafter until a reduction of at least 80% to 95% is achieved).

Only innovative, breakthrough technologies may deliver emission reductions set out by the EU ETS.

# EU metal industry warmly welcomes the Innovation Fund

- Currently the EU and Finnish Steel and Metal industry is exploring several emission reduction approaches
- Funding should be provided from the ETS revenues, EU research funds (such as Horizon 2020) and national authorities. We welcome therefore the Commission's efforts to provide funding and facilitate access to EU funds for promising projects.
- Regarding the EU ETS Innovation Fund:
  - Funding mechanisms should better promote risk sharing (for example, the Environment Committee increases the risk sharing for the project costs proposed by the Commission from 40% to 60%. However, this concerns not the operational costs once the project has ended (e.g. electricity costs).
  - The timeline of funding has to be shorter and more reliable.
  - The Innovation Fund should focus on abatement technologies in industry and the integration of renewables and hydrogen into manufacturing.
  - The fund has to be financed with allowances from the auctioning share, not from the free allocation share.
  - Whilst initial funding for the first technology upscaling steps is available until 2020, it is of absolute importance that continuous support is also provided in the period for 2021-2030.

# CO2 emission reduction approaches

(1) Carbon Capture and Storage (so called CCS): Top Gas Recycling Blast Furnace using plasma torsch (TGR-BF).

(2) Carbon Capture and Usage (so called CCU), meaning the chemical conversion of $CO_2$ captured from industrial processes: Carbon2Chem, Steelanol.

(3) Carbon Direct Avoidance (so called CDA), based on an increased use of hydrogen replacing carbon in metallurgical processes, directly avoiding $CO_2$ emissions: GrInhy, H2Future, HYBRIT, SALCOS, SuSteel.

(4) CDA with or without CCS : HIsarna.

(5) MECO, Metal ecosystem

# Metallinvalmistajat panostavat päästöjen vähentämiseen, tuotteiden elinkaaren pidentämiseen ja jätteiden minimointiin

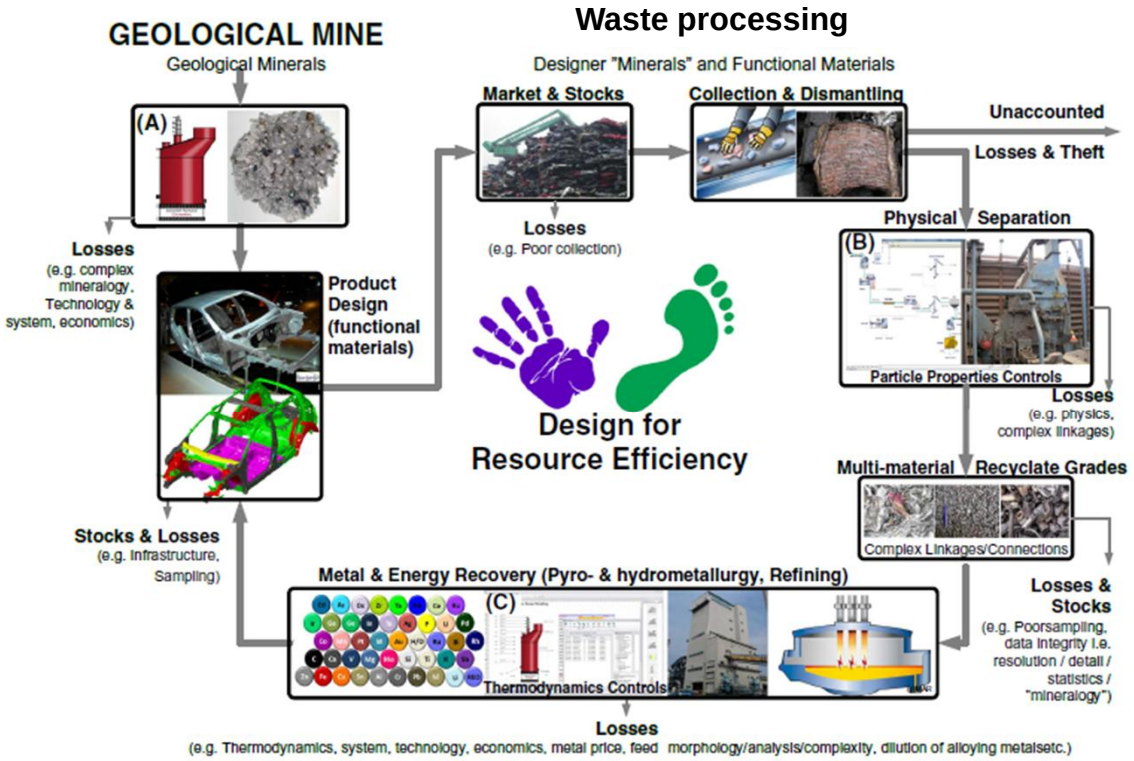
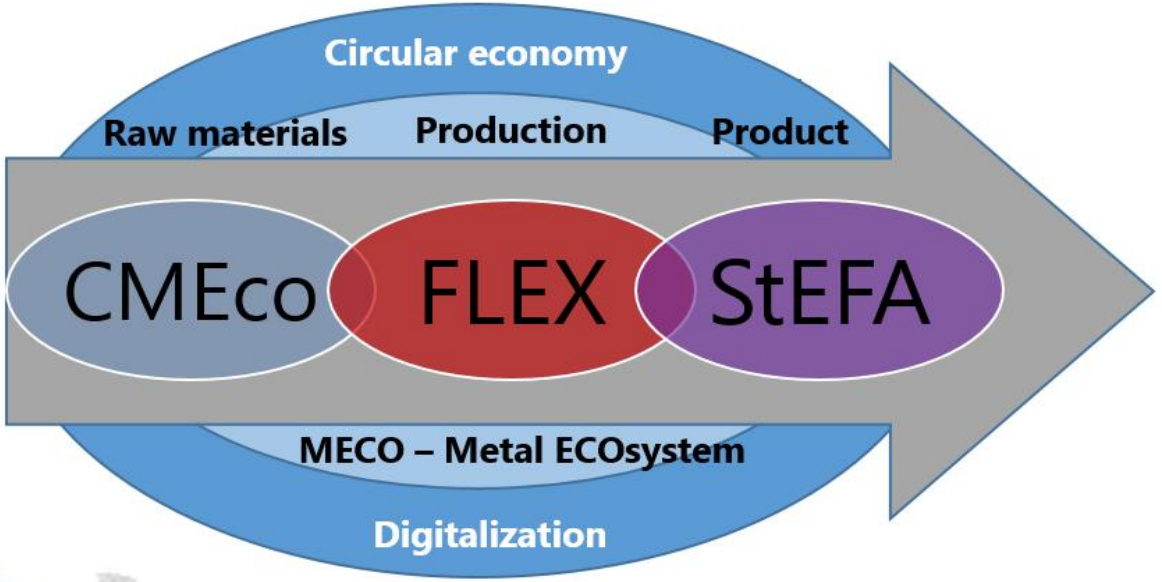
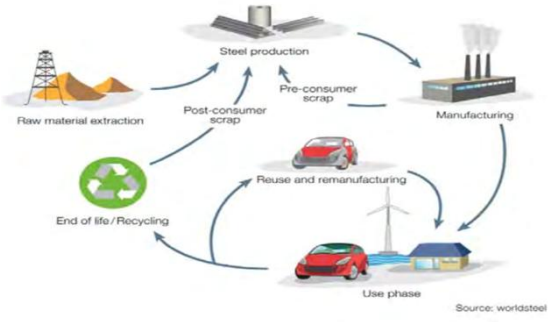



Fig. 1 Overview of the various stakeholders affecting RE, which have to be addressed in DfRE if it reaches the depth required to define the baseline and innovate the system architecture, technology and policy on a rigorous techno-economic basis (Biemer et al. 2013; Reuter and Van Schaik 2012, 2015)

# MECO, Metal Ecosystem

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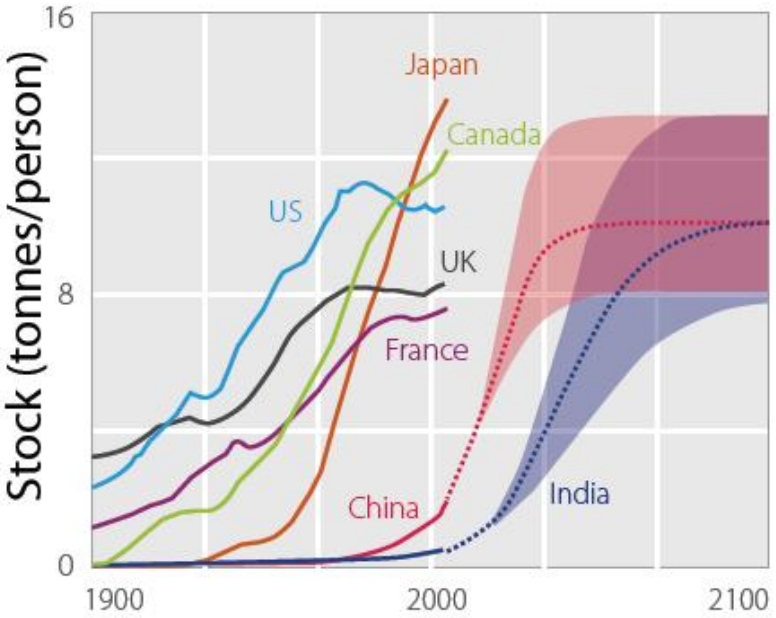
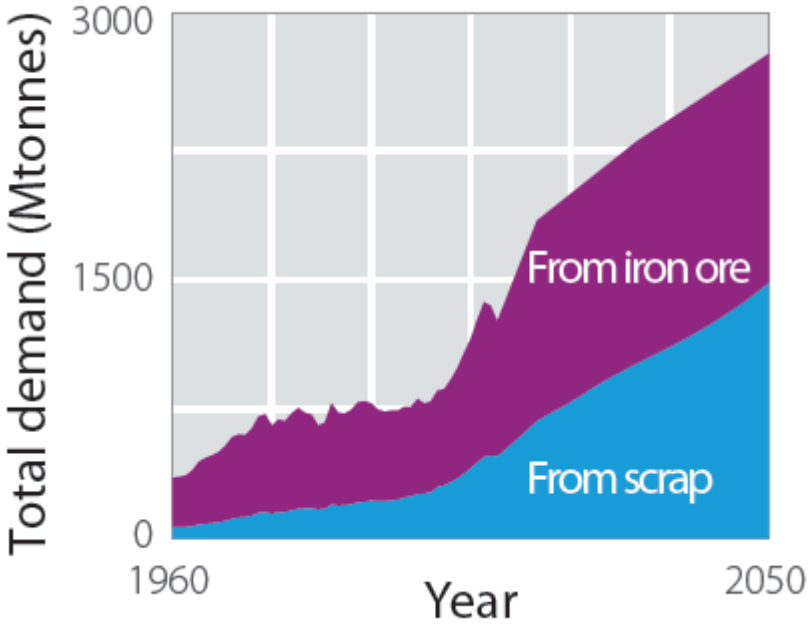
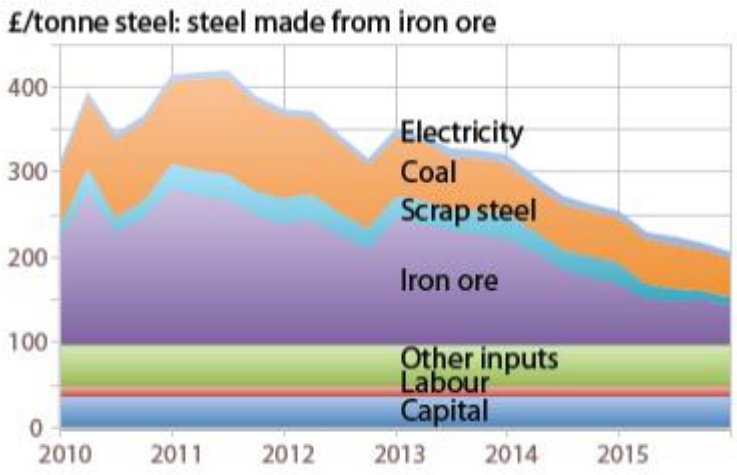
# Teräksen ja kierrätysromun kysyntä kasvaa tasaisesti

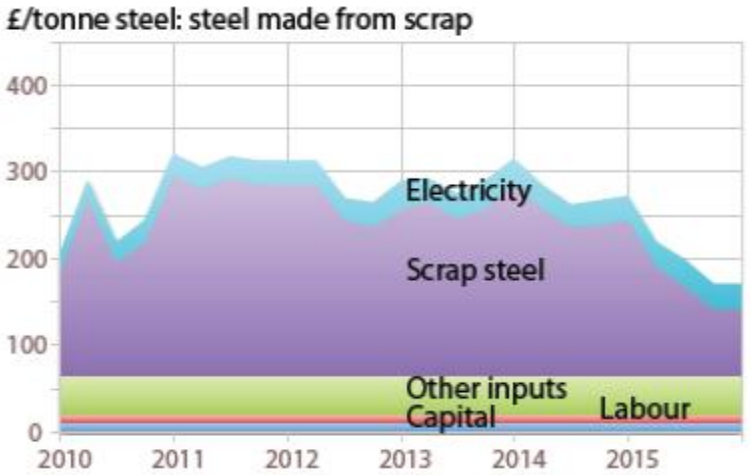



Lähde: Julian M Allwood, A bright future for UK steel, April 2016, University of Cambridge

# Energian- ja raaka-aineiden hinta ratkaiseva

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# JÄTTEENLOUHINTA

AVFALLSBRYTNING | WASTE EXCAVATION

**1000 kg**

ÄLYPUHELIMIA
SMARTTELEFONER
SMARTPHONES

**1000 kg**

KULTAMALMIA
GULDMALM
OF GOLD ORE

|  |  |  |
|---|---|---|
| **250 g** | **2700 g** | **120 kg** |
| KULTAA<br>GULD<br>GOLD | HOPEAA<br>SILVER<br>SILVER | KUPARIA<br>KOPPAR<br>COPPER |
| **4 g** | **10 g** | **4 kg** |
|  |  |  |

**TIESITKÖ?**
**VISSTE DU DETTA?**
**DID YOU KNOW?**

Yhtä kultasormusta varten täytyy louhia tonni kultamalmia. Saman verran kultaa löytyy myös kymmenestä kilosta älypuhelimia.
För en guldring måste man bryta ett ton guldmalm. Samma mängd guld finns även i tio kilogram smarttelefoner.
In order to produce one gold ring, 1,000 kg of gold ore must be excavated. The same amount of gold is also contained in 10 kg of smartphones.

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# Johtopäätökset

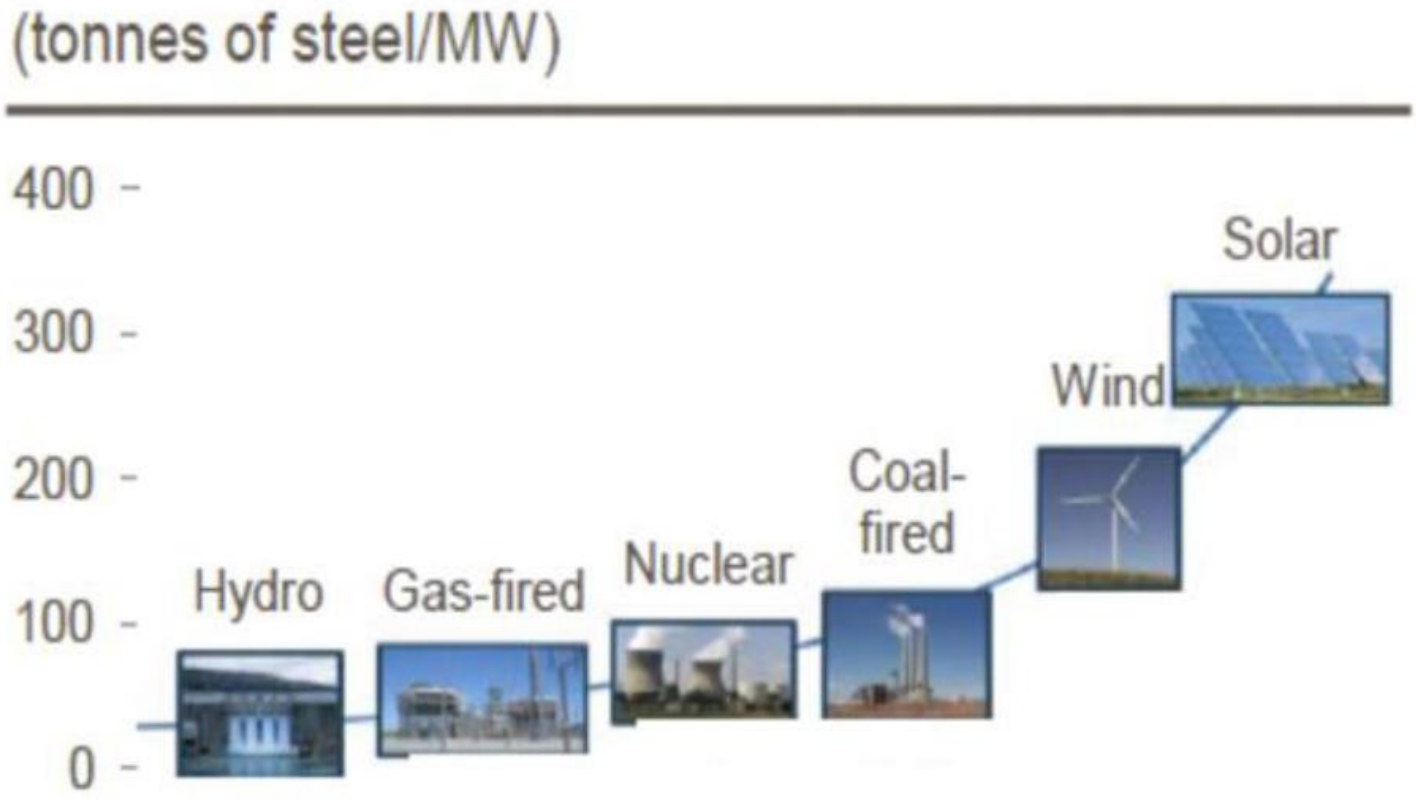


**Figure 18:** Amount of steel in power applications (From [67])

# Johtopäätökset

**According to the Northwest Mining Association, A single 3-MW wind turbine needs:**

•335 tons of steel.
•4.7 tons of copper.
•1,200 tons of concrete (cement and aggregates)
•3 tons of aluminum.
•2 tons of rare earth elements.
•aluminum.
•zinc.
•molybdenum.

Metals and minerals in wind turbines | Wind Energy Impacts and Issues
*https://www.wind-watch.org/documents/metals-and-minerals-in-wind-turbines/*