



23/12/2012

## Improving steel representation in ETSAP-TIAM

Wouter Nijs

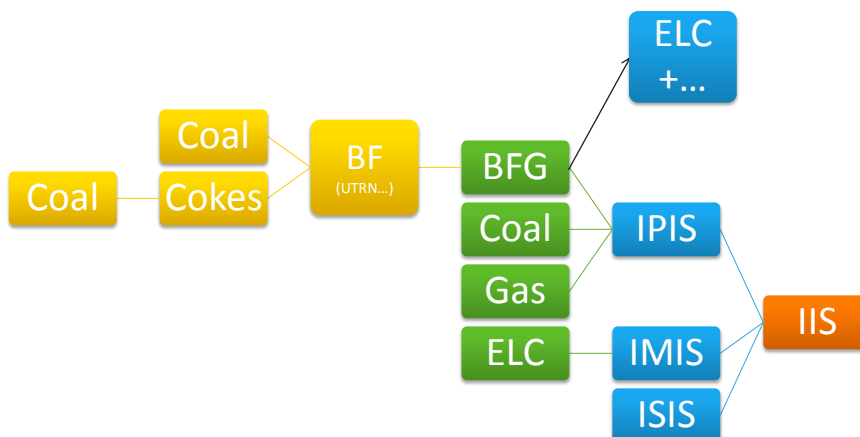
### Improving steel representation in ETSAP-TIAM

- » Existing methodology (energy balance based with some constraints for the use of coal) will be checked.
- » Emission allocation mechanism will be introduced for a better allocation of GHG emissions between IIS sector and ELC.
- » The implementation of a technology based RES for IIS into ETSAP-TIAM will be realized rather than an energy balance based.
- » The discussion of the boundaries of the use of scrap will be improved.
- » Iron and steel producing technologies will be updated. They will be brought in line with E-TechDB.
- » Oxygen production technology for IIS (mainly consuming electricity) will be introduced.

## Current approach

- » Energy balance based
  - » Official energy balance (IEA as well ?)
    - » Transformation part of BF (cokes/coal to BFG) in...
    - » Process part of BF (cokes/coal for de-oxydation) : largest part of coke
  - » ETSAP TIAM:
    - » All coke is in BF input (cfr 40% efficiency) ?
    - » INDBFG has ZERO INDCO2 emission factor (ok, otherwise doublecounting)
    - » The process UTRN..BF has an averaged emission coefficient for BFG, based on historical input of cokes, coal and the efficiency of about 40%)

## Current approach



## Current approach

- » No coupling of BFG with iron production
- » No explicit representation of electric arc (nor the competition between primary routes and secondary routes)
- » No iron ore in the model (big impact on steel price, cfr elasticities)
- » IFIS (feedstock for IIS) accidentally zero ? Part of the cokes is used for BFG production.

## Current approach

- » BF Resid to zero in 2055. New investments in blast furnaces possible,
  - » BY\_Trans: no new capacity for processes with RESID, but Upstream left out. So: investment in new BF is possible and the investment cost is zero.
- » New investments in BFG, but BF not coupled with steel demand. BF is used as a fuel conversion process:
  - » BFG fuel for CHP as a substitute for Natural Gas
  - » Makes no sense since you better burn the coal directly
  - » .. But coal is not allowed for steam for CHP (SCEN\_UCIND)
- » BF works mainly as a gasification process from cheap cokes coal to BFG (certainly after 2055).

## Challenges for transformation

- » Transformation should not alter the calibration
- » Check conversion of coke to BFG
- » For existing steel production, the conversion to pure coal and/or gas has to be verified and the use of electricity (electric arc).
- » Idea is to
  - » Make existing steel production more in line with reality (example is to have a lower limit for BFG use)
  - » Fade out IIS00 (easy)
  - » To include a new subres for new steel production (status: in preparation)
  - » To create a new demand scenario in which steel demand is projected according to World Steel Association and others (easy)
  - » To make a world scrap supply based on the cumulative demand functions (rather difficult because of trade ?). IF to difficult > exogenous, based on Excel