Improving steel representation in ETSAP-TIAM

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» 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

» 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) accidently 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