AMS III.U: Methane capture and destruction in non-hydrocarbon mining activities

Applicability:

- Capture and flare of methane from geological structures used for prospecting of non- hydrocarbon minerals (e.g.gold exploration)
- Dedicated methane or natural gas extraction excluded.
- Extraction of coal or oil shale, boreholes/wells for gas/oil exploration excluded.
- Only boreholes drilled before 2001 qualify, no heat/electricity generation from the captured methane – to address gaming as explained in next slide

Baseline and project emissions:

- ex ante baseline estimate based on measured data (flow rate and composition of residual gas for minimum one year to be considered)
- Project emissions based on "Tool to determine project emission from flaring gases containing methane".

Monitoring:

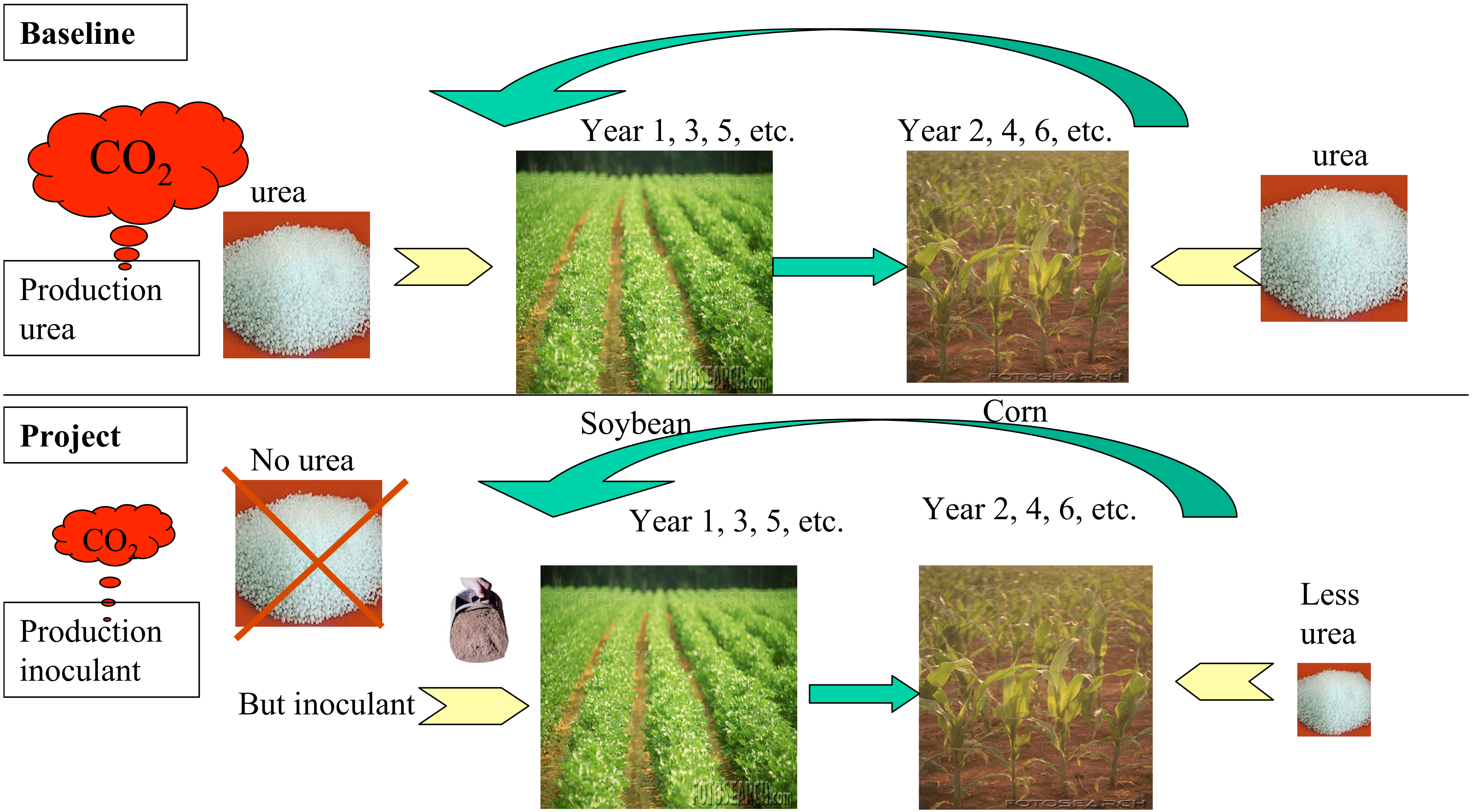
- The methane flared monitored as per "Tool to determine project emission from flaring gases containing methane".

AMS III.U: Methane capture and destruction in non-hydrocarbon mining activities

Background

- Originally submitted as a request for deviation of ACM0008 (Beatrix Methane Capture Project)
- Deviation not accepted, PPs were asked to submit a new methodology
  - as ore-reserve definition boreholes will not influence methane emissions in active mining areas (ACM0008 covers Coal Bed Methane and Coal Mine methane capture in the active mining area)
  - Such boreholes are outside the boundary definition of ACM0008
  - Procedures to avoid drilling additional boreholes near emitting ones for the sake of CDM incentive lacking
- AM0064 “Methodology for mine methane capture and utilisation or destruction in underground, hard rock” was approved for methane capture in active mining areas (does not allow capture of methane from exploratory boreholes that do not intersect mining areas)
- AMS III.U has safeguards (historic measured flow rates, date of drilling of boreholes) to address the above concerns

Urea offset by inoculant application in soybean-corn rotations on acidic soils on existing crop land (1)



Inoculants: rhizobia bacteria sprayed seeds, form nodules with roots of soybean, fixing nitrogen from atmosphere

Soybean Corn

Urea offset by inoculant application in soybean-corn rotations on acidic soils on existing crop land (2)

- Applicability:
  - Application of inoculant on soybean in a soybean-corn rotation cropping on acidic soils on existing cropland
  - Use of urea in previous 3 rotations (3-6 years), no inoculants used

- Baseline:
  - Qty of urea applied to soybean and corn
  - Urea application rate based on historic farm records but limited to nationally recommended levels
  - Combined tool to identify the baseline scenario and demonstrate additionality to identify the baseline scenario

Urea offset by inoculant application in soybean-corn rotations on acidic soils on existing crop land (3)

- Project/Monitoring:
  - ER based on qty of urea displaced (no urea to soybean, less to corn) and difference in energy consumption for urea production and inoculant production.
  - Conservative EF for urea production used (default value comparable to best plant of Europe)
  - EF for inoculant: all steps in the inoculant production process requiring energy consumption included, e.g. peat drying, peat grinding, peat and inoculant packaging, peat injection, fermentation, sterilization, liquid harvest and plant heating/cooling
  - Farm records cross-checked with data of inoculant production, data of distributors of urea and inoculant
  - Field visit by independent agronomist to each farm every year => check soy nodules for signs of external N application

Main differences between NM0198 and SSC-NM007

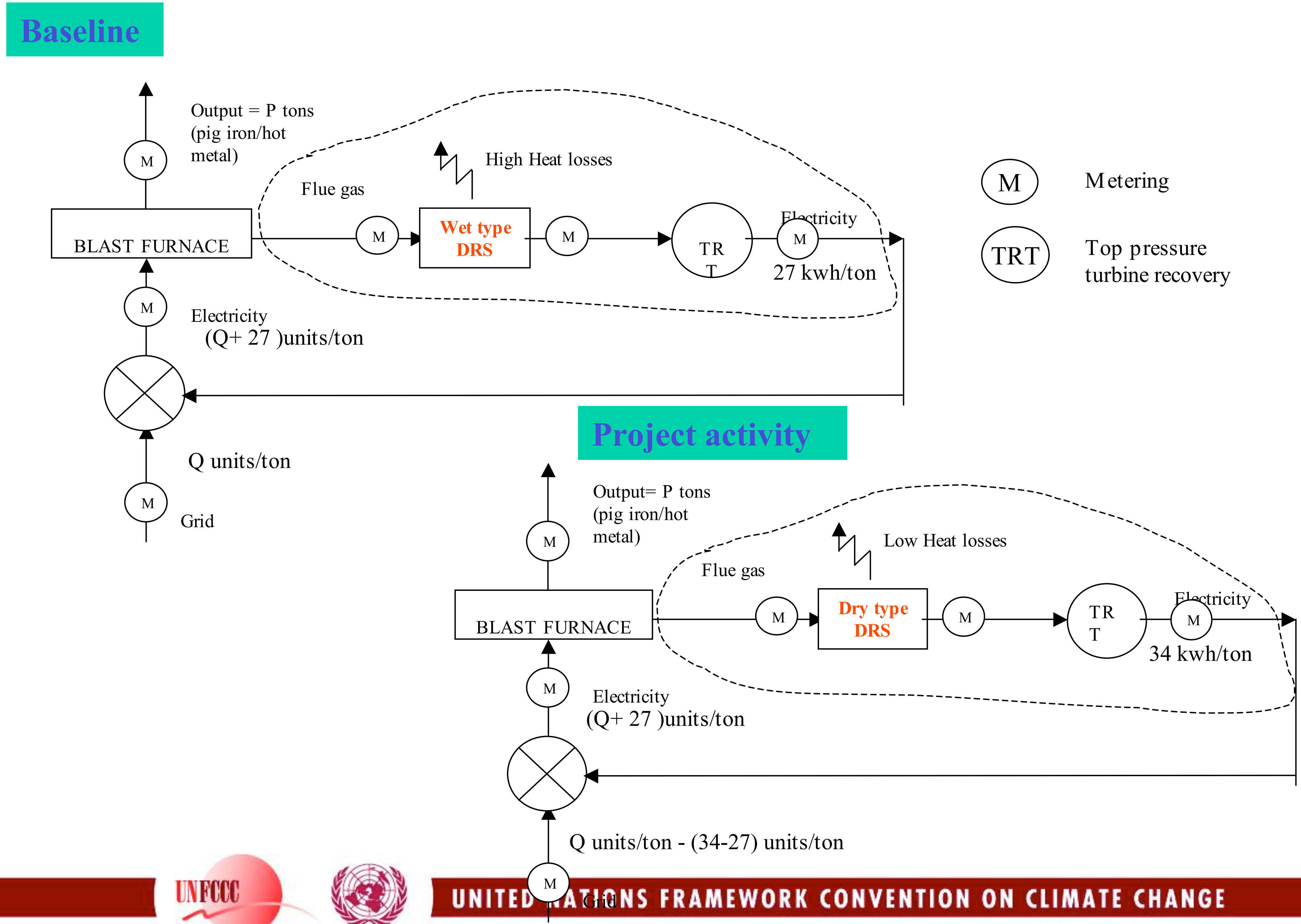
NM0198

- ER: reduced N2O emissions from soil from fertilizer use + reduced CO2 emissions fertilizer production
- Baseline: excessive amount of N application to inflate the baseline was a concern (no limit proposed in the meth.)
- Leakage emissions from processing/drying peat base inoculant not included
- Monitoring: Application of other N fertilizer in project scenario not checked
- Country specific to Brazil

SSC-NM007

- ER: reduced CO2 emissions from urea production (13% of ER compared with NM0198)
- Baseline: Amount of N applied based on historic farm records (cap at nationally recommended levels)
- Leakage emissions from use of peat included
- Monitoring: each farm every year, random check of fields. Check of nodules for external source of N, done by independent expert
- Applicable to soybean - corn rotations anywhere

AMS II.I: Efficient utilization of waste energy in industrial facilities



AMS II.I: Efficient utilization of waste energy in industrial facilities

- **Technology/Measures**
  - to improve the efficiency of electricity or thermal energy generation from recovered waste energy from a single source
  - the ratio of waste energy to production output is constant for the targeted production process
- **Applicability**
  - Production process where it is possible to directly measure and record energy efficiency parameters
  - Production outputs (e.g., hot metal) in baseline and project scenario remain homogenous and within a range of ±10% with no change in installed capacity
- **Baseline**
  - A benchmark Energy Generation Ratio (EGR), which is the amount of thermal energy/electricity generated per unit of main product.
  - The baseline emissions is the improvement in EGR times emission factor of electricity displaced.
- **Project Monitoring:**
  - Energy production and consumption in the generating unit
  - Production output
  - Flue Gas enthalpy per unit of production output (e.g. hot metal from the blast furnace); the levels before and after the project implementation are compared

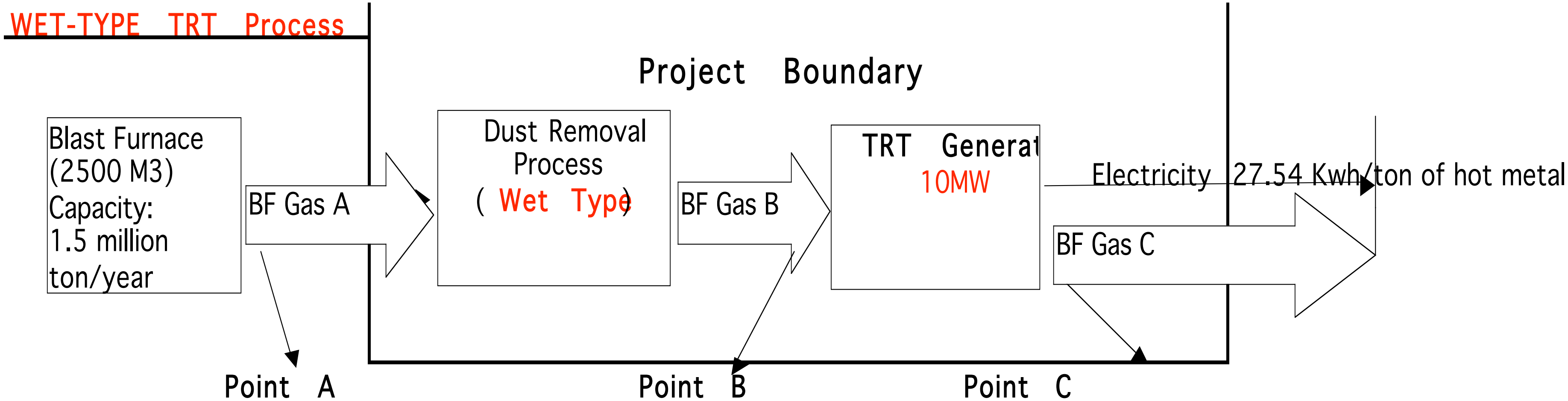
AMS II.C: Demand side energy efficiency activities for specific technologies

- It is now required to demonstrate that the capacity or output or level of service (e.g., light output, room temperature and comfort) of the replaced appliance/equipment is not significantly larger or smaller (maximum ± 10%) than the baseline. For example if an incandescent bulb is being replaced with CFL light, the latter should provide at least the same level of service as the replaced incandescent i.e. equivalent lumens.
- Guidance on consideration of electricity transmission and distribution losses is provided
- Guidance on treatment of direct emissions from refrigerants where relevant
- As there is no clear basis to determine baseline emissions for energy efficiency equipment **installed at new sites**, the methodology is now limited to the replacement of the existing equipment.

Reserve slides

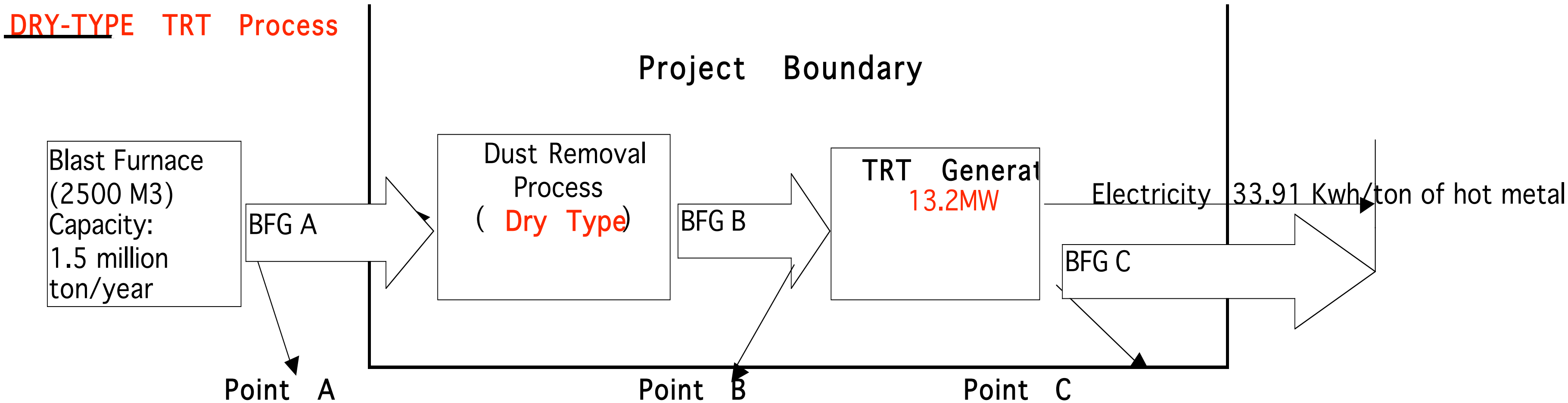
AMS II.I: Efficient utilization of waste energy in industrial facilities

Baseline



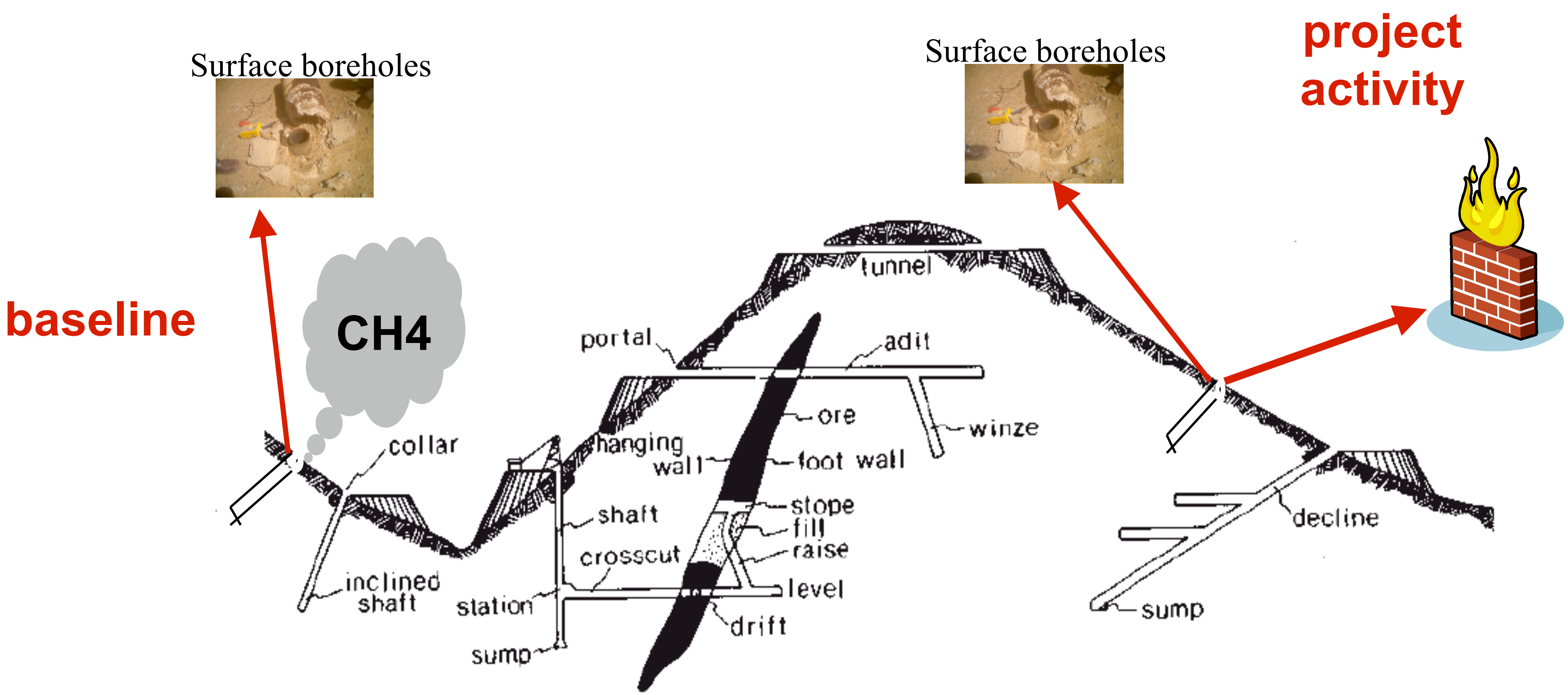
	Point A	Point B	Point C
Flow Rate	35 NM3/second	35NM3/second	35 NM3/second
Temperature	110 oC	58oC	35 oC
Pressure	180Kpa	140Kpa	14 Kpa

Project activity

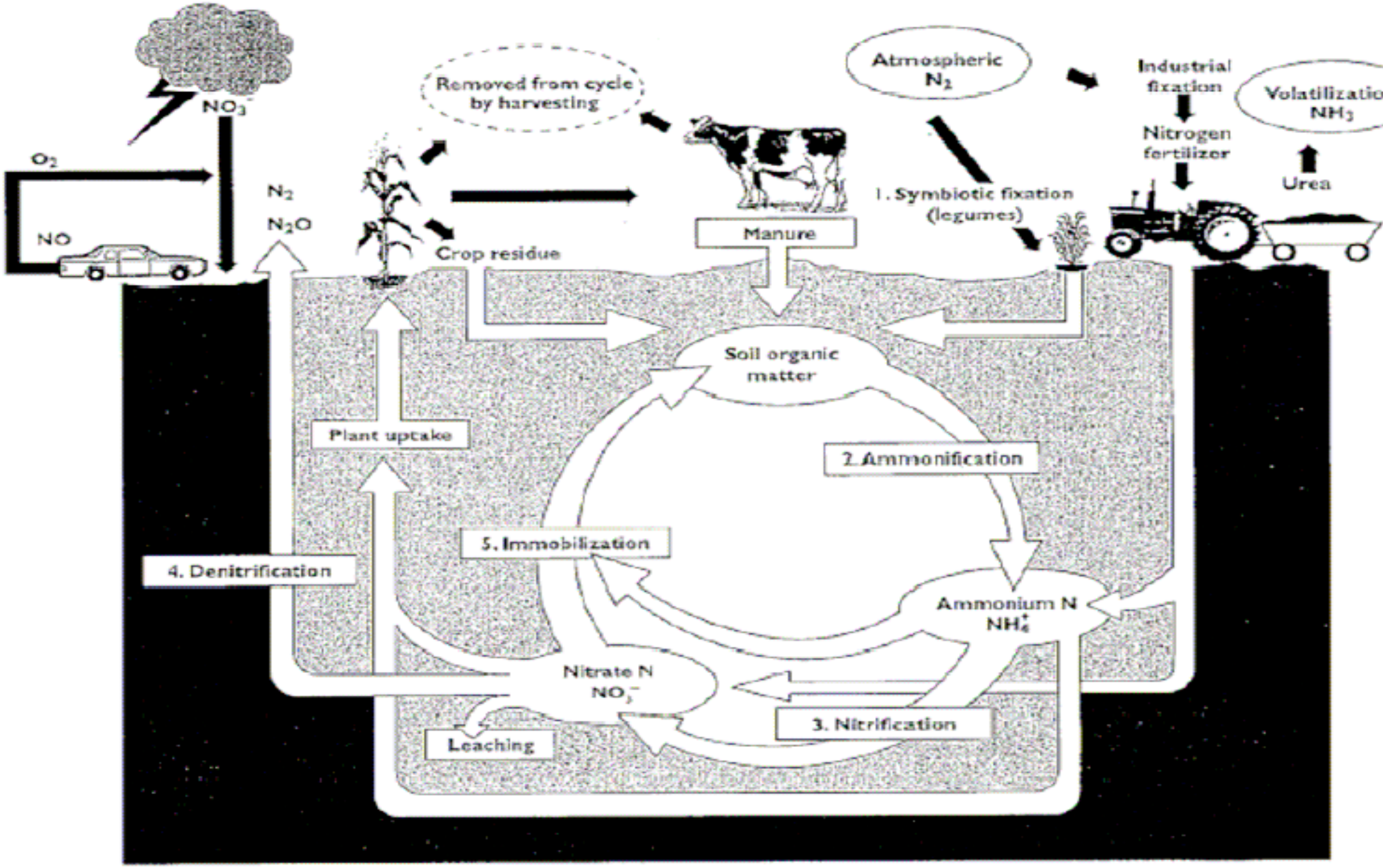


	Point A	Point B	Point C
Flow Rate	35 NM3/second	35NM3/second	35 NM3/second
Temperature	110 oC	110oC	50 oC
Pressure	180Kpa	175Kpa	14 Kpa

Methodology for methane capture and destruction in non-hydrocarbon mining activities

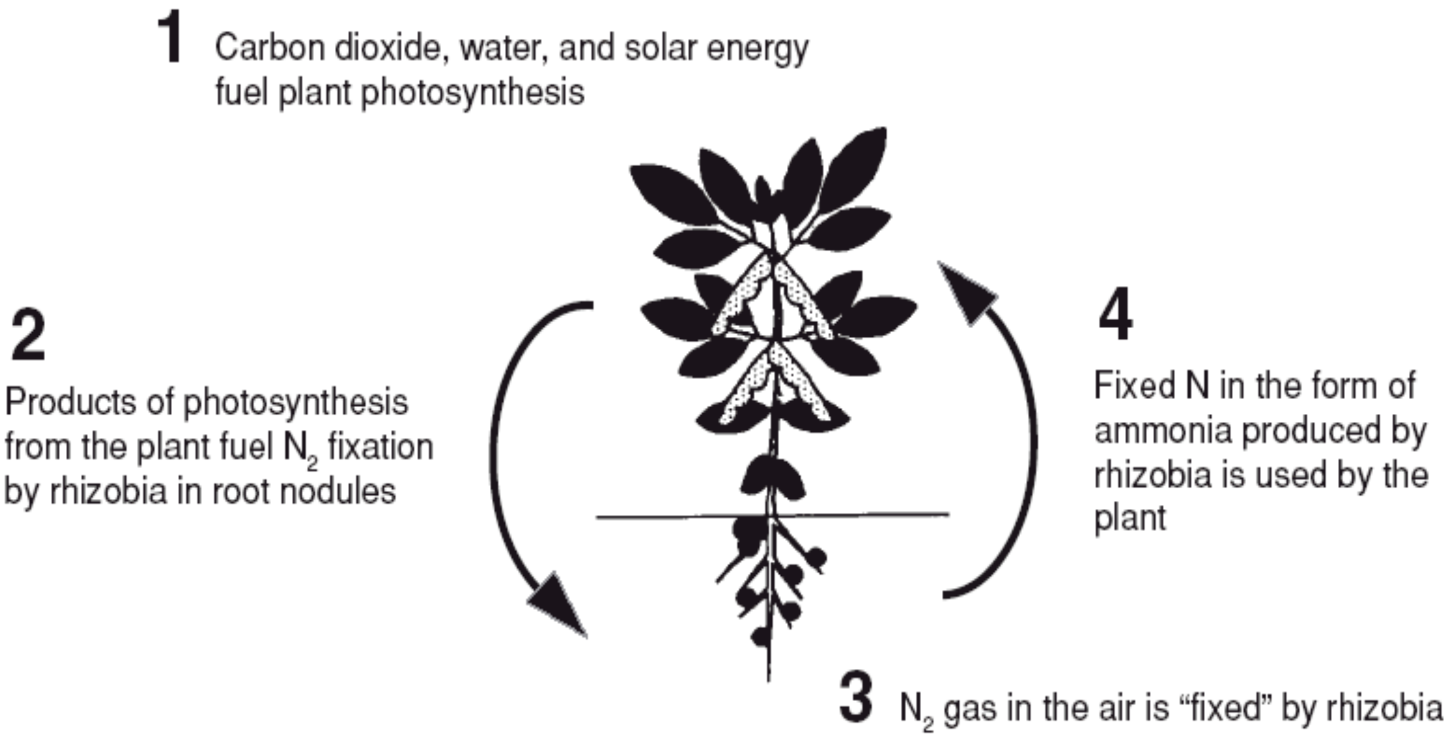


Urea offset by inoculant application in soybean-corn rotations on acidic soils on existing crop land (4)



Source: Bundy (1998)

Urea offset by inoculant application in soybean-corn rotations on acidic soils on existing crop land (5)



Urea offset by inoculant application in soybean-corn rotations on acidic soils on existing crop land (3)

Table 6: Greenhouse Gas Emission Factors for Urea and Urea Ammonium Nitrate (UAN) Production.

Product	Country	Composition	g $CO_{2\text{-}e}$			Reference
		N:P:K	per kg N	per kg Product	CO_2:N_2O:CH_4	
Urea	Europe Average	46:0:0	*4018.9*	1848.7	97.5:0.1:2.3	Davis and Haglund (1999)
Urea	Europe Average	46:0:0	*1326.1*	610.0	-	Kongshaug (1998)
Urea	Europe: Modern Tech.	46:0:0	*913.0*	420.0	-	Kongshaug (1998)
Urea	Europe	*46:0:0*[a]	1707.3	*785.4*	-	Kuesters and Jenssen (1998)
UAN	Europe	*32:0:0*[a]	3668.0	*1173.8*	36.6:63.4:0.0	Kuesters and Jenssen (1998)
UAN	Europe Average	32:0:0	*5762.9*	1844.1	59.1:39.5:1.4	Davis and Haglund (1998)
UAN	Europe Average	32:0:0	*4093.8*	1310.0	-	Kongshaug (1998)
UAN	Europe Modern Tech.	32:0:0	*2000.0*	640.0	-	Kongshaug (1998)

(a) Composition from Kongshaug (1998).
Note: Figures in *italics* are derived values, based on % N composition.

From: A Review of Greenhouse Gas Emission Factors for Fertiliser Production.

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Cooperative Research Centre for Greenhouse Accounting For IEA Bioenergy Task 38 **June 2004**