Energy Conservation at cement plant

Workshop on Low Carbon Technologies

- NAMAs and JCM -

3 December 2013

Ulaanbaatar, Mongolia

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1. Outline of the project

Type of survey	JCM / FS
Project name	Energy Conservation at cement plant
Mongolian Counterpart	EREL Cement
Proposed Project site	Darkhan (Дархан), Mongolia
Brief description of the project	Conserve energy at cement manufacturing and reduce GHG emission by converting cement manufacturing process from wet to dry, mentioned in NAMA 8-C

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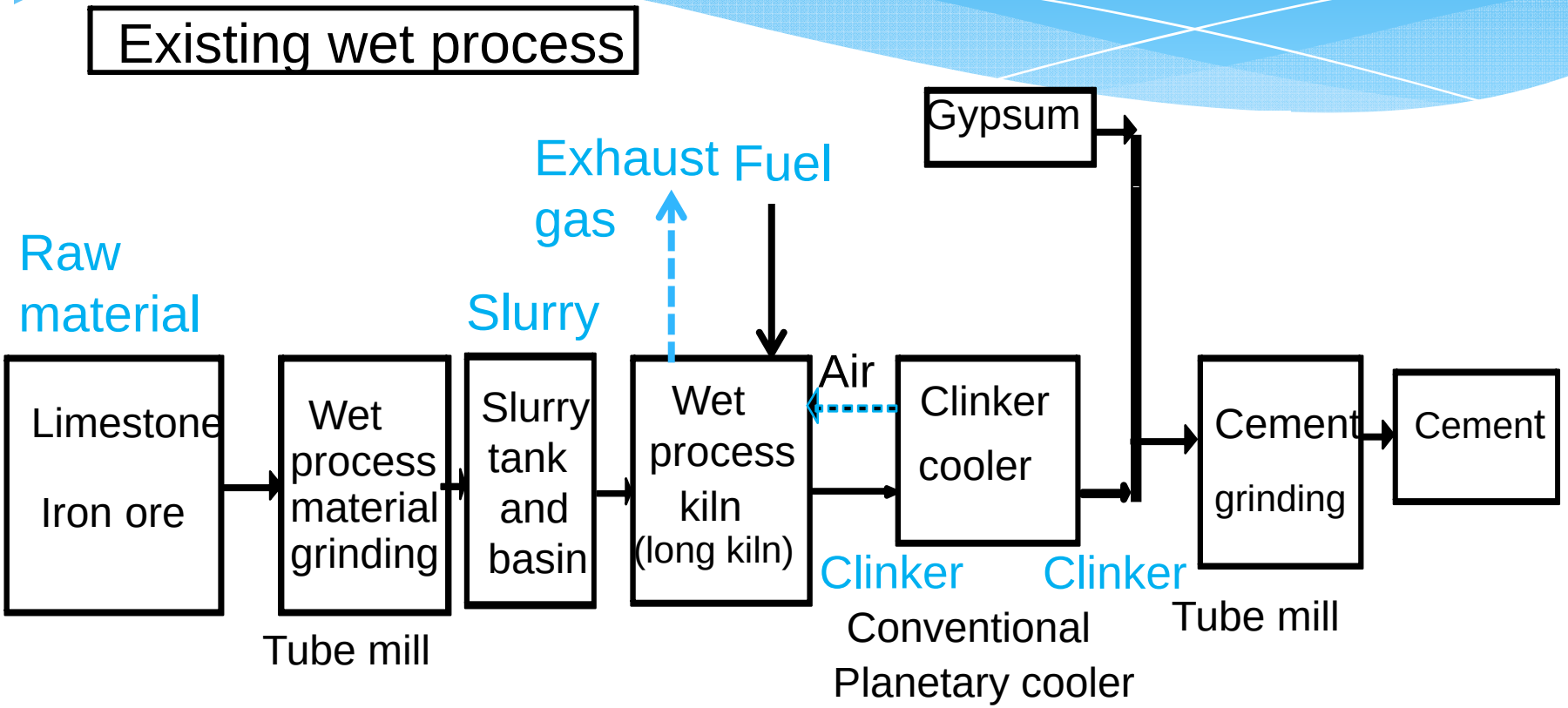
1. Outline of the project(Cont'd)

EREL Cement plant (wet process)

1. Outline of the project(Cont'd)



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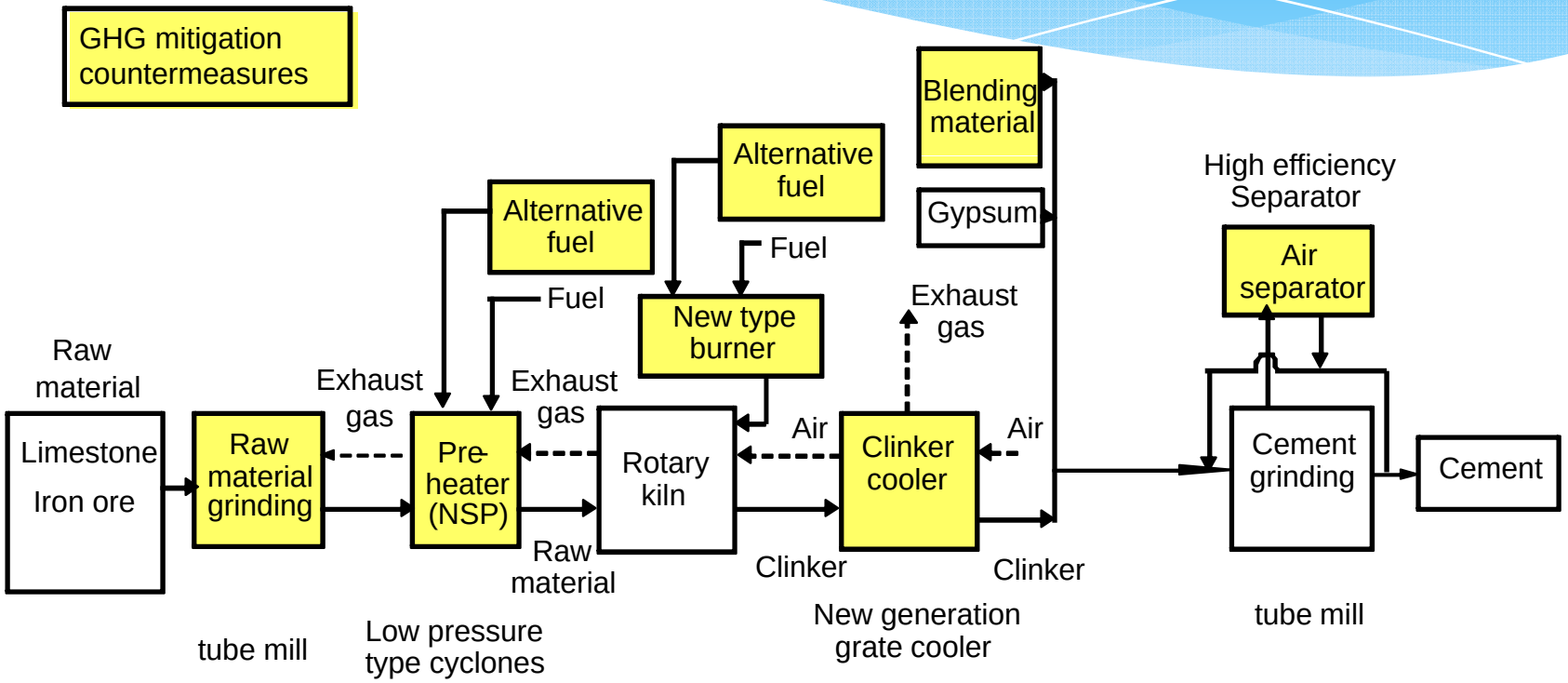
1. Outline of the project(Cont'd)

Proposed dry process



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Example of dry process plant (similar to project capacity)

1. Outline of the project(Cont'd)

Issues considered for this project

- Site condition
  - High altitude of proposed site reduces heat efficiency
  - Low calorific value coal
- Scale of proposed plant
  - Considering long-term cement demand, large scale plant is not economical.
- Equipment selection considering local condition
  - Operation and maintenance availability of Mongolia should be considered for stable operation and easy maintenance

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2. Proposed project schedule

* 2014 Completion of FS, decision of implementation and confirmation of finance scheme
* 2015-2017 Construction of plant
* Approval of Methodology is expected
* 2017 Completion of plant construction, commissioning and commencement of commercial operation
  Commencement of record
* 2018 onward Calculation of emission reduction

3. Proposed Methodology

3.1 Eligibility Criteria

3.2 Proposed Reference Scenarios

3.3 Basis for reference emission

3.4 Monitoring of project emission

3.5 Emission reduction

3.6 Contribution to sustainable development of Mongolia

3.1 Eligibility Criteria

No.	Criteria
1	Introducing process should improve energy efficiency of existing cement plant Capacity :2,500t/d or more Heat consumption 900kcal/kg-clinker or less Electricity consumption 105Kwh/t-cement or less
2	Up to existing capacity, 35 % and above unit CO2 emission reduction comparing to reference scenario（Scenario 1) should be expected at planning base
3	Above existing capacity, 8 % and above unit CO2 emission reduction comparing to reference scenario（Scenario 1) should be expected at planning base
4	Proposed process should be equipped with bag-filter or ESP
5	Energy loss should be minimized by operation efficiency and stability with Japanese technology

3.2 Calculation of reference emission (Proposed Reference Scenarios) (t.b.c.)

Scenario 1

Current wet process emission--- up to rated capacity of wet process and dry process emission---exceed to wet process capacity

Scenario 2

Wet process emission with operation management at all production capacity

Scenario 3

Reference dry process emission at all production capacity

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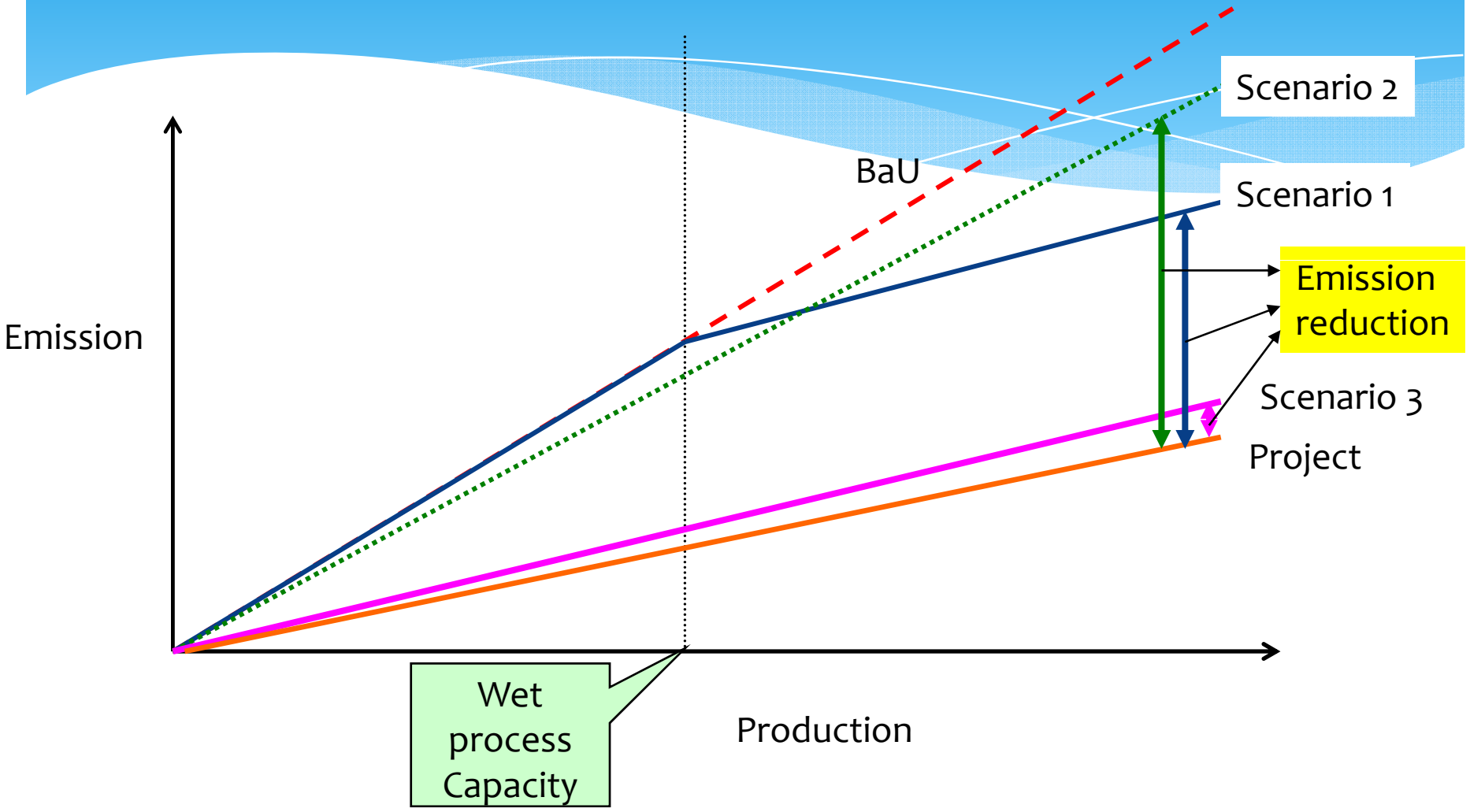
3.2 Calculation of reference emission (Proposed Reference Scenarios) (Cont'd)



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3.3 Basis for reference emission

Items Process	Unit heat consumption Kcal/kg-clinker	Unit electricity consumption kWh/t-cement	Note
Current wet process	around 2000	around 170	=BaU
Managed wet process	1600	170	Estimated reduction
Reference dry Process	t.b.c.	t.b.c.	Appropriate data required
Proposed dry process	900	105	Estimated

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3.3 Basis for reference emission (Cont'd) Necessary data for reference emission

* Current wet process emission
  * Obtained from surveyed plant --- to be used as national value.
* Wet process emission with operation management
  * Derived from plant survey.

* Reference dry process emission
  * Assumed energy consumption for dry process under construction should be obtained and used.

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3.4Monitoring of project emission

Item	method	Frequency	Proof
Emission from thermal energy	Coal transaction record and inventory	Per transaction	Regularly certified by Mongolian Department of Metrology
Emission from electricity	Reading of transaction instrument	Per month	
Cement production	Weighing by truck/car scale at plant	Per shipment	

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3.5 Emission reduction (Estimated)

* Based on scenario 1 ,within annual production capacity

	CO_2 from Thermal energy t	CO_2 from electricity t	Total CO_2 emission t
Reference emission	89,216	18,330	107,546
Project emission	38,238	11,320	49,558
Estimated emission reduction	50,978	7,010	57,988

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3.6 Contribution to sustainable development of Mongolia

* Cement is essential commodity for infrastructure development in Mongolia.
* Existing cement plants are of old technology, their energy consumption and environment impact may affect the sustainable development.
* Proposed system reduces energy consumption and eliminate environment impact , and mitigate GHG emission.
* Utilization of waste material such as coal ash can be considered.
* These points will contribute the sustainable development of the country.

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4. Way to JCM Registration

* Acquisition/preparation of necessary data.
* Consideration of criteria
* Confirmation of reference scenario
* Precise re-calculation of emissions
* Establishment of proposed methodology

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