CLEAN DEVELOPMENT MECHANISM
SMALL-SCALE PROGRAMME OF ACTIVITIES DESIGN DOCUMENT FORM
(CDM-SSC-PoA-DD) Version 01

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NOTE:

(i) This form is for the submission of a CDM PoA whose CPAs apply a small scale approved methodology.

(ii) At the time of requesting registration this form must be accompanied by a CDM-SSC-CPA-DD form that has been specified for the proposed PoA, as well as by one completed CDM-SSC-CPA-DD (using a real case).

SECTION A. General description of small-scale programme of activities (PoA)

A.1 Title of the small-scale programme of activities (PoA):

Energy efficiency programme for ceramic kilns in Liaoning Faku Economic Development Zone
Version: 02
Date: 30/11/2012

The version history of the PoA-DD is summarized as below.

Version Number	Date	Purpose and/or main revision
01	10/02/2012	GSP Version
02	30/11/2012	Submission for registration

A.2. Description of the small-scale programme of activities (PoA):

Chinese ceramic production is the largest in the world. However, energy consumption in ceramic industry is one important GHG emission source. Compared with world advanced entity, the energy consumption of Chinese ceramic industry is much less efficient. Energy efficiency programme for ceramic kilns in Liaoning Faku Economic Development Zone (hereinafter referred to as "the proposed PoA") aims at improving energy efficiency among existing ceramic plants and those to be built in Liaoning Faku Economic Development Zone. There are 51 ceramic plants at present in the zone, and it is expected to increase to 70 plants. All the ceramic production plants are potential CDM Program Activities (CPA). Each CPA of the proposed PoA will use "Blackbody Radiation Strengthen Technology" (BRST) to improve energy efficiency by replacing, modifying or retrofitting existing kilns or installing new kilns (Greenfield facility). Each CPA will include these activities in one or several ceramic kilns within the boundary of the PoA. The revenue obtained from CERs will encourage ceramic plants to improve energy efficiency and therefore supporting the program implementation.

1. General operating and implementing framework of PoA

The coordinating/managing entity (CME) of the proposed PoA is Beijing Uniufa Energy Technology Co., Ltd. (Uniufa). Uniufa will function as CDM consultant for CDM documents development, validation and verification assistant and coordination. Uniufa is also responsible of selling CERs to buyers and allocating CER revenues to individual CPA implementers.

Lakewood Carbon One Corp (LCC I) will be buyer of the CERs. Together with the CME, LCC I has been involved in the development of this PoA starting from project identification and concept development. LCC I will take the assisting role to the CME for the coordination and management activities of the PoA.

Individual CPA owners (CPA implementers) will invest and implement the CPA voluntarily. CPA implementers will sign contract with CME to confirm that the project activities are added into the proposed PoA. Monitoring activities will be carried out by individual CPA implementers. The data will be managed and kept both under CPA implementer and CME's database for DOE verification.

The general operating and implementing framework of the proposed PoA is also showed in the following figure A.2.1.

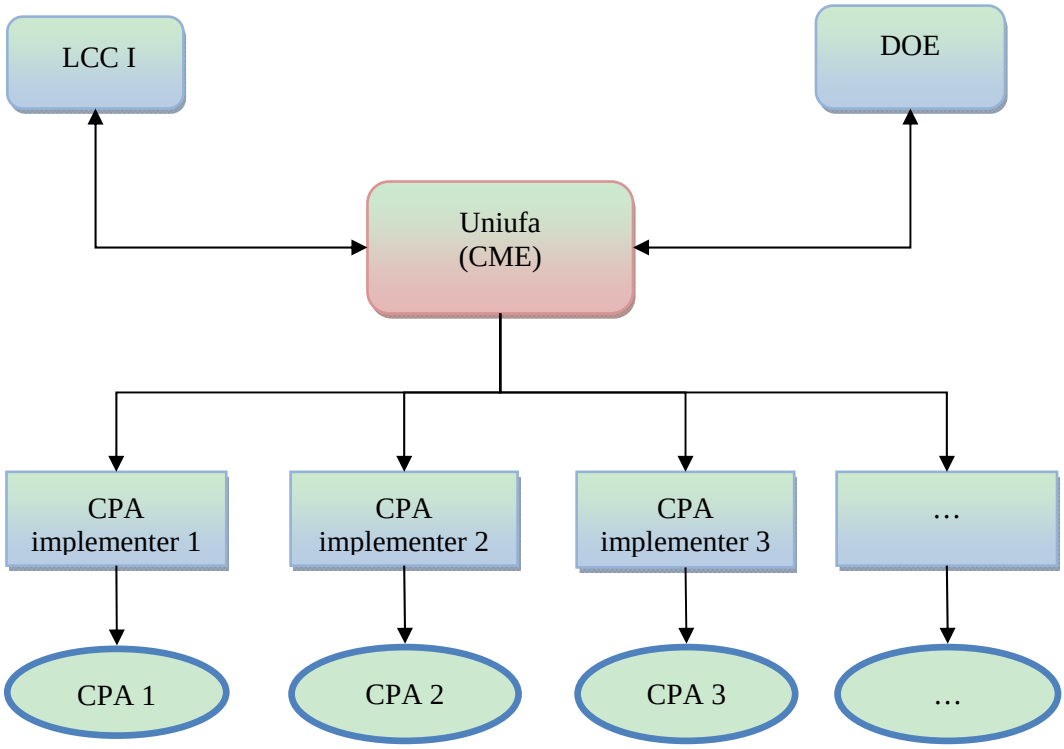


Figure A.2.1 Operating and implementing framework of the proposed PoA

2. Policy/measure or stated goal of the PoA

The direct energy feeds in ceramic kilns of Liaoning Faku Economic Development Zone are fossil fuels. The purpose of the proposed PoA is to motivate existing ceramic plants and those to be built to adopt "BRST" measures to improve kiln energy efficiency by replacing, modifying or retrofitting existing kilns or purchasing new kilns (Greenfield facility). Thus, the GHG emissions will be reduced due to less use of fossil fuels.

The PoA will have positive environmental and social benefits and contribute to sustainable development of the host country by:

- Improving the energy efficiency, thus saving fossil fuels and reducing CO2 emissions;
- Improving the local environment quality by reducing harmful emissions (including SO_x, NO_x and TSP) caused by fossil fuel combustion;
- Improving the local investment environment and stimulating local economic development.

3. Confirmation that the proposed PoA is a voluntary action by the coordinating/managing entity.

The proposed PoA is a voluntary action by CME since,

- Current energy consumption levels of ceramic plants in Liaoning Faku Economic Development Zone comply with national and local standards and there are no compulsory pressures for ceramic plants to improve energy efficiency;
- The CME participate this PoA voluntarily and there are no mandatory rules that enforce the

implementation of PoAs by the CME.

A.3. Coordinating/managing entity and participants of SSC-POA:

The coordinating/managing entity of the PoA as the entity which communicates with the Board is Beijing Uniufa Energy Technology Co., Ltd. (Uniufa)

Name of Party involved (*) ((host) indicates a host Party)	Private and/or public entity(ies) project participants (*) (as applicable)	Kindly indicate if the Party involved wishes to be considered as project participant (Yes/No)
People's Republic of China (host)	Beijing Uniufa Energy Technology Co., Ltd.	No
United Kingdom of Great Britain and North Ireland	Lakewood Carbon One Corp.	No

A.4. Technical description of the small-scale programme of activities:

A.4.1. Location of the programme of activities:

A.4.1.1. Host Party (ies):

People's Republic of China

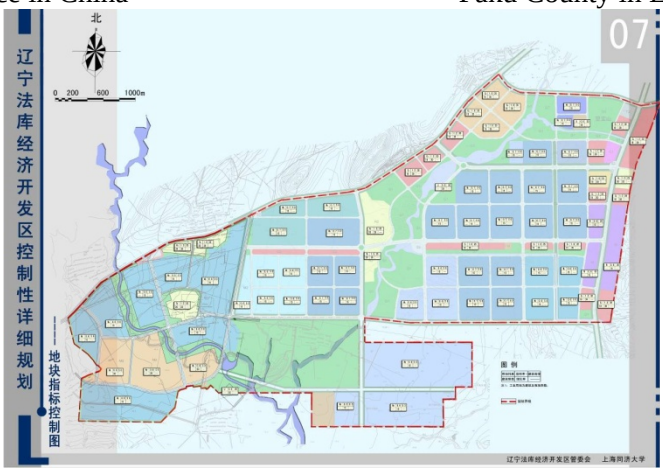
A.4.1.2. Physical/ Geographical boundary:

The proposed PoA will be implemented within the boundary of Liaoning Faku Economic Development Zone, Faku County, Liaoning Province. It covers the area from northern latitude 42°27'19" to 42°29'27" and east longitude from 123°19'8" to 123°24'11".

The CPA geographic location will be identified by their actual GPS coordinates within above area.

Liaoning Province in China

Faku County in Liaoning Province



Regulatory detailed planning diagram of Liaoning Faku Economic Development Zone, boundary of PoA. (Northern latitude from 42°27’19” to 42°29’27” and east longitude from 123°19’8” to 123°24’11”).

Figure A.4.1 Boundary of the Proposed PoA

A.4.2. Description of a typical small-scale CDM programme activity (CPA):

A.4.2.1. Technology or measures to be employed by the SSC-CPA:

“Blackbody Radiation Strengthen Technology” (BRST) to improve kiln heat efficiency will be employed in each individual CPA.

Background: Kilns in production of ceramics

A typical ceramic production process usually contains shaping, drying, glazing, and firing, as show in the following chart A4.2.1.

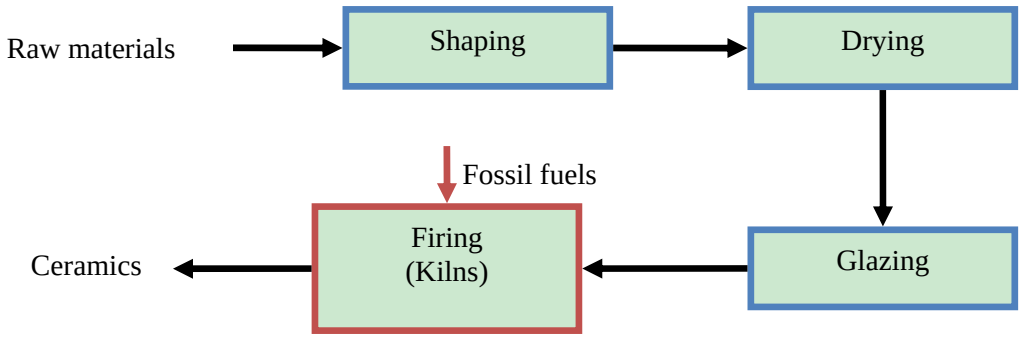


Chart A4.2.1 Typical production process of ceramics

Firing process is the final process in ceramic production which is also the main energy consumption sources in ceramic production. The primary facilities of the firing process are kilns, using fossil fuels (e.g. oil, coal gas, natural gas) as the energy feed.

The control of firing process is the key element for quality of ceramic products. No matter how successful the previous process, if the firing process fails, the product quality will fail. However, the thermal system is extremely complicated and any change may impact the stability of the thermal process. A stable system is usually formed from repeated tests and experiments. Experienced, skilled operators and a stable control system are highly valued by the industry.

Employed Technology: BRST
All CPAs in the proposed PoA will replace, modify or retrofit existing kilns or install new kilns (Greenfield facility) with a patented technology, named "Blackbody Radiation Strengthen Technology" (BRST), which can improve kiln heat radiation property by adding blackbody units to kiln walls and roofs. Blackbody unit has a radiation emittance rate of 0.96. The heat can be absorbed and emitted highly efficiently by the blackbody units and the energy efficiency can be generally improved by about 20%. Thus, emission reduction will be achieved due to less combustion of fossil fuel of the heating system (kiln). This would also prevent pollution from fossil fuel consumption. This technology is environmentally safe and sound.

Blackbody units can improve energy efficiency in the following three aspects.
- Blackbody units can increase the areas of heat transmission without changes of the kiln structure.
- Blackbody units can absorb random heat radiation in the kilns and emit directional heat radiation to targeted work-pieces, thus to improve kiln heat transmission efficiency.
- Blackbody units have high heat-radiation absorption and high heat-radiation emittance rate, thus to improve heat utilization efficiency since more useful heat-radiation can be formed to heat ceramic products.

The project uses domestic technology, no technology transfer will occur.

A.4.2.2. Eligibility criteria for inclusion of a SSC-CPA in the PoA:

According to "Standard for demonstration of additionality, development of eligibility criteria and

application of multiple methodologies for programme of activities"[1] (Version 01.0), a CPA to be included in the PoA should meet a minimum of the following:

Table A4.1 Eligibility criteria

No.	Eligibility criteria Requirements	Specifications
(a)	The geographical boundary of the CPA including any time-induced boundary consistent with the geographical boundary set in the PoA;	The CPA shall be within the geographical boundary of the PoA, which is Liaoning Faku Economic Development Zone. Each CPA shall be uniquely identified by geographical coordinates.
(b)	Conditions that avoid double counting of emission reductions like unique identifications of product and end-user locations (e.g. programme logo);	Each CPA shall be checked with the host country DNA and EB data base to make sure it has not been already registered either as a CDM project activity or as a CPA of another PoA. And unique ID will be given to each CPA, such as CPA-001, CPA-002 and so on.
(c)	The specifications of technology / measure including the level and type of service, performance specifications including compliance with testing / certifications;	Each CPA shall adopt "BRST" to improve energy efficiency and thus to save energy use of affected facility or process by about20% , either replace, modify or retrofit existing kilns or install new kilns (Greenfield facility).
(d)	Conditions to check the start date of the CPA through documentary evidence;	Document evidence should be provided to make sure the start date of the CPA is not earlier than the validation date of the PoA. The start date of the CPA shall be the earliest date at which either the implementation or construction or real action of project activity begins.
(e)	Conditions that ensure compliance with applicability and other requirements of single or multiple methodologies applied by CPAs;	The CPA shall comply with applicability and other requirements in methodology AMS-II.D. "Energy efficiency and fuel switching measures for industrial facilities" (version 12). i.e. 1. The CPA shall be aimed primarily at energy efficiency and comprises BRST implemented at a single or several ceramic kilns. 2. The CPA may replace, modify or retrofit existing kilns using BRST or install BRST in a new kiln. 3. The energy used for the kilns can and shall be directly measured and recorded within the CPA boundary. 4. The impact of the measures implemented by the CPA can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity (signal to noise

[1] http://cdm.unfccc.int/UserManagement/FileStorage/E6TY7DMI28WGCUV5J0K3LAOHBQ9RFN

		ratio). 5. The aggregate energy savings of a single CPA (inclusive of a single facility or several facilities) may not exceed the equivalent of 180 GWh_{th} per year in fuel input. 6. In the case of replacement, modification or retrofit measures, the baseline consists of the energy baseline of the existing facility or sub-system that is replaced, modified or retrofitted. In the case of project activities involving several facilities, the baseline needs to be established separately for each site. In the case of project activities involving multiple energy efficiency measures at individual facilities, the interaction between the measures should be taken into consideration when establishing the baseline. For new facilities and project activities involving capacity additions, the energy baseline consists of the facility that would otherwise be built; the most plausible baseline scenario for the project activity shall be evaluated based on the related and relevant requirements in the General Guidance for SSC methodologies. In the absence of the CPA, the existing kilns (or kilns to be otherwise built for greenfield project) would continue to consume energy (EC_{BL} in GWh/year) at historical average levels (or historical average levels from other similar plant for greenfield project)(EC_{HY} in GWh/year), until the time at which the kilns would be likely to be replaced, modified or retrofitted in the absence of the CDM project activity ($DATE_{BaselineRetrofit}$). From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and baseline energy consumption (EC_{BL}) is assumed to equal project energy consumption ($EC_{PJ,y}$ in GWh/year), and no emission reductions are assumed to occur." 7. Conditions regarding leakages[2]. (1) The equipment currently being utilised shall not be transferred from outside the boundary to the project activity. (2) The CPA in this PoA shall not involve fossil fuel switching measures. If involved, the leakage emissions in the baseline situation shall be higher than leakage emissions in the project situation, and hence, leakage emissions can be set to zero. (3) In case the CPA involves the replacement of equipment, the replaced equipment shall be scrapped and the leakage effect can be neglected. An independent monitoring of scrapping of replaced equipment needs to be implemented.

[2] According to AMS-II.D paragraph 11,14,and 15.

		The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose, scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.
(f)	The conditions that ensure that CPAs meet the requirements pertaining to the demonstration of additionality;	1 Each CPA shall prove through investment analysis that the CPA would not occur in the absence of CDM because of investment barrier, according to "Guidelines on the demonstration of additionality of small-scale project activities" (version 09.0, EB68). For investment comparison analysis, the financial indicators (e.g. NPV, IRR) of the proposed CPA (without CDM revenue) shall be below that of other alternatives. For benchmark analysis, the IRR of the proposed CPA (without CDM revenue) shall be below the benchmark. The discounting rate or financial benchmark can be taken from the latest version of official publication "Economic evaluation measurements and parameters of constructive projects", which offers an appropriate guide. 2 Basic parameters such as initial investment, O&M cost, and energy saving revenue for the calculation of cash flow shall have several reliable sources and can be crosschecked. 3 Sensitivity analysis shall be conducted for variables such as fuel price, total investment, and annual O&M cost. The variations should at least cover a range of +10% and -10%. 4 Adopting BRST for ceramic kilns is not mandatory in Liaoning Faku Economic Development Zone.
(g)	The PoA-specific requirements stipulated by the CME including any conditions related to undertaking local stakeholder consultations and environmental impact analysis;	Each CPA shall undertake an environmental impact analysis and the EIA shall be approved by relevant authorities. .
(h)	Conditions to provide an affirmation that funding from Annex I parties, if any, does not result in a diversion of official development assistance;	There is no funding from Annex I parties for each CPA. If any, it does not result in a diversion of official development assistance.
(i)	Where applicable, target group	N.A. No requirements regarding target group and distribution

	(e.g. domestic / commercial/ industrial, rural/urban, grid-connected/off-grid) and distribution mechanisms (e.g. direct installation);	mechanisms.
(j)	Where applicable, the conditions related to sampling requirements for a PoA in accordance with the approved guidelines/standard from the Board pertaining to sampling and surveys;	N.A. No sampling is required in this PoA.
(k)	Where applicable, the conditions that ensure that every CPA in aggregate meets the small-scale or microscale threshold criteria and remains within those thresholds throughout the crediting period of the CPA;	The energy saving of every CPA in aggregate meets the small-scale threshold criteria of 180 GWh_{th} per year throughout the crediting period.
(l)	Where applicable, the requirements for the debundling check, in case CPAs belong to small-scale (SSC) or microscale project categories.	The SSC-CPA included in the PoA shall conduct debundling check according to annex 13 in EB 54.A proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity[3], which: (a) Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same sectoral scope, and; (b) The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.

A.4.3. Description of how the anthropogenic emissions of GHG by sources are reduced by a SSC-CPA below those that would have occurred in the absence of the registered PoA (assessment and demonstration of additionality):

As per the template of the PoA-DD, the following shall be demonstrated here:
(i) The proposed PoA is a voluntary coordinated action;

Energy consumption levels of ceramic plants in Liaoning Faku Economic Development Zone comply with national and local standards[4] and there are no mandatory policy/regulation requirements for ceramic plants to introduce BRST technology to improve energy efficiency. The proposed PoA is a voluntary coordinated action and only claims emission reductions from voluntary actions.

[3] Which may be a (i) registered small-scale CPA of a PoA, (ii) an application to register another small-scale CPA of a PoA or (iii) another registered CDM project activity

[4] GB21252-2007 The Norm of Energy Consumption per unit Product of Architecture and Aanitary Ceramics

(ii)If the PoA is implementing a voluntary coordinated action, it would not be implemented in the absence of the PoA;

As per "Guidelines on the demonstration of additionality of small-scale project activities" (version 09.0, EB68), "Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:" (a) Investment barrier; (b) Technological barrier; (c) Barrier due to prevailing practice; (d) Other barriers. It is demonstrated below that the proposed PoA would not have occurred because of investment barrier.

As mentioned in the above eligibility criteria, each CPA going to be added into this PoA shall prove through investment analysis that the CPA would not occur in the absence of CDM. Without CER revenue, individual CPA implementer will not invest such a project. The CPA faces investment barrier. If the proposed PoA is not carried out, ceramic plants would continue to use existing or traditional kilns while use those extra capital to invest in other financially attractive options (e.g. more ceramic production lines). Thus the PoA faces investment barrier that prevent the PoA to implement.

(iii) If the PoA is implementing a mandatory policy/regulation, this would/is not enforced;
Not applicable as there is no mandatory law to enforce the ceramic plants to introduce BRST to enhance energy efficiency.

(iv) If mandatory a policy/regulation is enforced, the PoA will lead to a greater level of enforcement of the existing mandatory policy/regulation.
Not applicable as mentioned above.

A.4.4. Operational, management and monitoring plan for the programme of activities (PoA):

A.4.4.1. Operational and management plan:

The CME shall have the competencies to check the features of potential CPAs and ensure that each CPA meets all requirements and eligibility criteria before inclusion in the registered PoA. The CME has developed and implemented a management system as Fig.A.4.1.

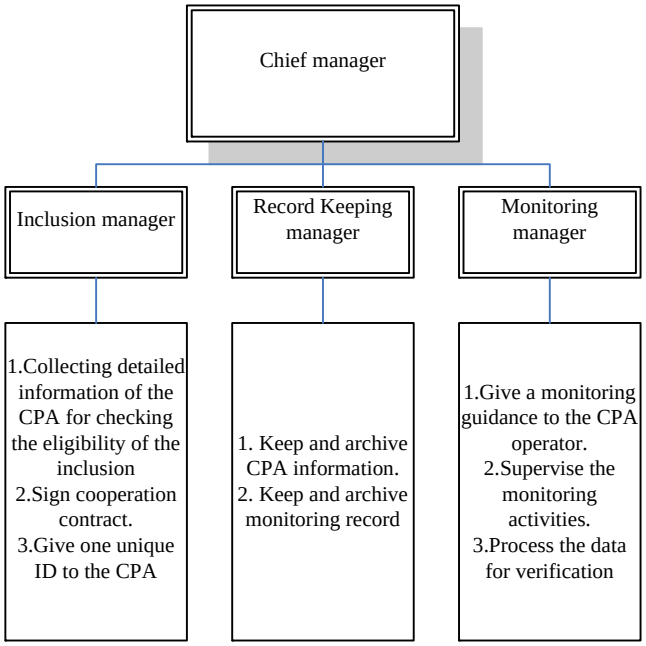


Fig.A.4.1. CME management system

The CME management system mainly includes three functions.

Inclusion manager:

1. Responsible for the detailed information collection, mainly including,
    a) The name of the operator of each CPA
    b) Coordinates of each CPA.
    c) The specification of the technology used by each CPA
    d) Start date of each CPA
    e) The expected energy saving quantity by each CPA.
    f) The indicators of investment analysis of each CPA, such as IRR.
    g) The situation of funding from annex I parties.
2. Check the collected information with the eligibility criteria listed in Table A.4.1 item to item to make sure the CPA is eligible to be included to the PoA.
3. Sign the cooperation with the CPA implementer, to make sure the implementer agrees to be involved in, and the CME is the exclusive manager of the CDM activity.
4. Give one unique ID to the CPA, such as CPA-001, CPA-002, CPA-***

Monitoring manager:

1. Give a monitoring guidance to the CPA operator, including the monitoring parameters, instruments, monitoring frequency, precision, calibration, and so on.
2. Supervise the monitoring activities, including data crosscheck.
3. Process the data for verification, and prepare the monitoring report.

Record keeping manager:

1. Keep and archive the detailed information of the CPAs.
2. Keep and archive the monitoring record of the CPAs. The data shall be kept electronically for two years after the end of the crediting period or the last issuance of CER.

The managers involved in the system shall have at least 2 years' working experience in CDM with a bachelor degree or 5 years working experience in related areas. They shall be familiar with requirements, terms and conditions in PoA-DD, each CPA-DD, and relevant methodologies. They shall be able to work independently and study continuously to improve the PoA management system.

Each manager of this PoA shall be appointed by the CME's technical department after close internal assessment of their competency. Necessary training and assessment shall be given to those managers during the PoA crediting period to ensure their competency for the work. The training and assessment shall be recorded.

Technical review shall be taken under the PoA team when including a CPA into this PoA. The chief manager shall lead the team to check whether the CPA's information under CME's system is correct, whether the CPA is a de-bundled component of another CDM programme activity (CPA) or CDM project activity, whether the CPA is double accounted, and whether the CPA implementer is voluntary to join this PoA.

Monitoring procedures and records of each CPA shall be audited annually under the PoA team. Any mistakes or inefficiency found shall be corrected and keep the correction recorded. If necessary, the management system shall be further developed or improved. Any improvement or development shall be kept record.

The demonstrated functions of the CME management system are described in details as follows,

(i) A record keeping system for each CPA under the PoA

CME acting on behalf of the CPA implementers participated in the programme shall maintain the data collected from each CPA according to the registered monitoring plan. A record keeping system shall be constructed to record CPA's general information (including plant name, address, contact information, geographical coordinates, kiln number, crediting period and its start date), operation and monitoring data. Each CPA shall be uniquely indentified in the record keeping system with unique CPA No. and Kiln No .

The record keeping would be both in paper and electronic format. All the data shall be kept and archived electronically for two years after the end of crediting period or the last issuance of CERs, whichever occurs later. The basic database about the PoA and the monitoring data for each specific CPA is included in part E.7.1.

(ii) A system/procedure to avoid double accounting e.g. to avoid the case of including a new CPA that has been already registered either as a CDM project activity or as a CPA of another PoA

The CPA implementer who is to implement the CPA would have to sign a contract with the CME (Uniufa). CME would offer training for the CPA implementer in order to let them know enough about the rules of CDM and PoA. What's more, the contract would include the item that the CPA implementer has aware and agreed that their activity is being subscribed under the PoA. The contract would also require the proponent of CPA to confirm that they have not previously been a part of any CDM project or under other PoA.

CME will also check with the host country DNA and EB data base before add any CPA into the PoA to make sure that the CPA has not been already registered either as a CDM project activity or as a CPA of another PoA.

When including a potential CPA, the following procedures can be taken to avoid double accounting.

(1) Check the potential CPA's implementer, type, province, and city whether they are the same with or included in a registered CDM project activity or a registered CPA of another PoA. If no, the CPA can be included in the PoA. If yes, procedure (2) shall be applied.
(2) Check the geographical location of the potential CPA whether they are close[5] to the CDM project activity or CPA of another PoA identified through procedure (1). If no, the CPA can be included in the PoA. If yes, procedure (3) shall be applied.
(3) Contact the implementer of the CDM project activity or CPA of another PoA identified through procedure (2). Documented Evidence shall be provided to prove that the potential CPA is not accounted in those registered CDM project activity or CPA. If necessary, on site confirmation shall be conducted.
(4) Internal audits by CME shall be conducted to ensure that the potential CPA is not already included in the PoA.

(iii) The SSC-CPA included in the PoA is not a de-bundled component of another CDM programme activity (CPA) or CDM project activity

According to paragraph 8 of annex 13 in EB 54, for the purposes of registration of a Programme of Activities (PoA)[6] a proposed small-scale CPA of a PoA shall be deemed to be a de-bundled component of a large scale activity if there is already an activity[7], which:

(a) Has the same activity implementer as the proposed small scale CPA or has a coordinating or managing entity, which also manages a large scale PoA of the same sectoral scope, and;
(b) The boundary is within 1 km of the boundary of the proposed small-scale CPA, at the closest point.

If the proposed CPA doesn't satisfy both (a) and (b), then the CPA is not a de-bundled component of another CDM programme activity or CDM project activity.

According to paragraph 9 of annex 13 in EB 54, if a proposed small-scale CPA of a PoA is deemed to be a debundled component in accordance with paragraph 2 above, but the total size of such a CPA combined with a registered small-scale CPA of a PoA or a registered CDM project activity does not exceed the limits for small-scale CDM project activities, the CPA of a PoA can qualify to use simplified modalities and procedures for small-scale CDM project activities.

(iv) The provisions to ensure that those operating the CPA are aware of and have agreed that their activity is being subscribed to the PoA

[5] Within 10 km

[6] Only those POAs need to be considered in determining de-bundling that are: (i) in the same geographical area; and (ii) use the same methodology; as the POA to which proposed CPA is being added

[7] Which may be a (i) registered small-scale CPA of a PoA, (ii) an application to register another small-scale CPA of a PoA or (iii) another registered CDM project activity

Each CPA implementer will make a statement in the contract signed with CME that they agree to add the CPA into the PoA.

A.4.4.2. Monitoring plan:

Each CPA will be verified.

A transparent system has been established to avoid double counting (see A.4.4.1). Individual CPA implementer is responsible to collect monitoring data and shall submit the monitored data monthly to CME. All monitoring data will be kept at CME's record keeping system for verification convenience. In this record keeping system, the natural sequence number of each CPA will be distinct and uniquely identified to avoid double counting, e.g. CPA-001, CPA-002 … CPA-***. The kilns in CPA are also numbered, e.g. CPA-001-Kiln-001. All the records and documentations related to monitoring and verification shall be kept and archived electronically for two years after the end of crediting period or the last issuance of CERs, whichever occurs later. Those data shall be available to DOE for verification at any point of time..

Detailed monitoring plan of each CPA please see E.7.

A.4.5. Public funding of the programme of activities (PoA):

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The PoA will not receive any public funding from Annex I Parties.

SECTION B. Duration of the programme of activities (PoA)

B.1. Starting date of the programme of activities (PoA):

Starting date of the proposed PoA: 21/02/2012 (the date of publication of the PoA-DD for global stakeholder consultation)

B.2. Length of the programme of activities (PoA):

28 years and 0 months
Starting date of the proposed PoA lifetime: 01/01/2013 (Or the date of PoA registration, whichever is later)

SECTION C. Environmental Analysis

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C.1. Please indicate the level at which environmental analysis as per requirements of the CDM modalities and procedures is undertaken. Justify the choice of level at which the environmental analysis is undertaken:

1. Environmental Analysis is done at PoA level ☐
2. Environmental Analysis is done at SSC-CPA level ✔

Environmental Analysis is done at SSC-CPA level. In this PoA, the CPAs are not carried out at the same time but at different stages by different implementer. Each CPA is an independent project and has

different environmental impact due to different circumstances. According to Chinese EIA law, EIA is obligatory for each CPA of this PoA.

C.2. Documentation on the analysis of the environmental impacts, including transboundary impacts:

N.A
/

C.3. Please state whether in accordance with the host Party laws/regulations, an environmental impact assessment is required for a typical CPA, included in the programme of activities (PoA),:

In accordance with the laws/regulations of China, an environmental impact assessment is required for a typical CPA, included in the programme of activities.

SECTION D. Stakeholders' comments

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D.1. Please indicate the level at which local stakeholder comments are invited. Justify the choice:

1. Local stakeholder consultation is done at PoA level ✔
2. Local stakeholder consultation is done at SSC-CPA level ☐

Stakeholder consultations have been done at the PoA level. Local stakeholders of Liaoning Faku Economic Development Zone are consulted and the result is positive.

D.2. Brief description how comments by local stakeholders have been invited and compiled:

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The local stakeholders' comments have been invited and compiled through public notifications, consultation meeting and questionnaire survey.

(1) Public notification
Before the questionnaire survey, notifications introducing program objective, main activities, expected benefits and modalities of the PoA were distributed to stakeholders as well as posted on the notification board of Liaoning Faku Economic Development Zone from April 11th, 2011. Subsequently, the questionnaire survey and consultation meeting were conducted in the following days.

(2) Questionnaire survey
A questionnaire survey investigates local stakeholders' opinion was conducted in Liaoning Faku Economic Development Zone. Totally, 80 questionnaires were distributed and collected up to May 10th, 2011. Local stakeholders with further interest in consultation were also invited during this questionnaire survey.

The questions asked in the questionnaires are as follows:

- What impacts do you think the program of CDM Project activities will have on the local environment?
- What impacts do you think the program of CDM Project activities will have on employment and social welfare in the local area?

- What impacts do you think the program of CDM Project activities will have on your livelihood?
- What impacts do you think the program of CDM Project activities will have on the local economic development?
- What type of impacts do you think the program of CDM Project activities will have as a whole?
- Do you support the construction of the program of CDM Project activities?

(3) Consultation meeting
A consultation meeting was held on May 14th, 2011. Local stakeholders including representatives of ceramic plants, local government officials, local citizens and farmers were invited to the meeting.

D.3. Summary of the comments received:

>>
Generally, local stakeholders' opinions to this PoA are positive. Local stockholders consider that the programme will play a critical role in ceramic industry energy saving and improvement of local environmental quality. It will generate significant social, environmental well as economic benefits. There were no complaints concerning negative implications of the program on local residents and rural areas. Most of implementers of ceramic plants are interested to participate in the program. Stakeholders from the potential CPA implementers are looking forward to see a pilot project to demonstrate the improvement of energy efficiency and promised CER revenues.

The table D.3.1 shows the structure of the respondents.

Table D.3.1 Structure of respondents of questionnaire

Index	Category	Number (persons)	Proportion (%)
Gender	Female	65	81
	Male	15	19
Age	<30	10	12
	30-40	43	54
	>40	27	34
Level of education	Primary	32	40
	Secondary	29	36
	Higher	19	24
Profession	Farmers and citizens	44	55
	Company employee	30	37
	Local government officials	6	8

Details of the answers of the questionnaire are summarized as follows.

Table D.3.2 Summary of answers to the questionnaire survey

Questions	Answer Category	Number (persons)	Share (%)
1. What type of impacts do you think the program of CDM Project activities will have on the local environment?	Positive impact	76	95
	Negative impact	0	0
	No impact	0	0
	Both positive and negative	4	4
2. What impacts do you think the program of CDM Project activities will have on	Positive impact	71	89
	Negative impact	0	0
	No impact	0	0

Questions	Answer Category	Number (persons)	Share (%)
employment and social welfare in the local area?	Both positive and negative	9	11
3. What impacts do you think the program of CDM Project activities will have on your livelihood?	Positive impact	79	99
	Negative impact	0	0
	No impact	0	0
	Both positive and negative	1	1
4. What impacts do you think the program of CDM Project activities will have on the local economic development?	Positive impact	80	100
	Negative impact	0	0
	No impact	0	0
	Both positive and negative	0	0
5. What type of impacts do you think the program of CDM Project activities will have as a whole?	Positive impact	80	100
	Negative impact	0	0
	No impact	0	0
6. Do you support the construction of the program of CDM Project activities?	Yes	80	100
	No	0	0

Comments received from consultation meeting are as follows.

- The development of the P-CDM process needs to be speed-up;
- Technical services and training for BRST installation need to be enhanced;
- Finance support for each CPA needs to be strengthened.

D.4. Report on how due account was taken of any comments received:

>>
As stated in D.3., stakeholders generally take a supportive attitude toward the implementation of this PoA. Comments and suggestions received from stakeholder's consultation were taken into account in the project design.

- CME will coordinate actively and try every effort to speed up the PoA CDM process.
- To the issue of inadequate knowledge and technical support, CME will provide more technical details of BRST. The PoA will start from one CPA as the pilot project and the following CPAs will be implemented after successful implementation of the pilot project.
- To the issue of financing difficulty in installation of BRST, the project would use part of the income generated from CERs to finance BRST installation, technical services and monitoring program.

SECTION E. Application of a baseline and monitoring methodology

E.1. Title and reference of the approved SSC baseline and monitoring methodology applied to a SSC-CPA included in the PoA:

The following approved baseline and monitoring methodologies and relevant tools are applied to a SSC-CPA included in the PoA,

The approved small-scale baseline and monitoring methodology used is:
AMS-II.D. Energy efficiency and fuel switching measures for industrial facilities (Version 12)
Available at
http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

Other tools and methodology are also used as,
General Guidelines to SSC CDM methodologies (Version 17)
Available at
http://cdm.unfccc.int/methodologies/SSCmethodologies/approved

Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (Version 02)
Available at
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf/history_view

Tool to determine the remaining lifetime of equipment (Version 01)
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf/history_view

Guidelines on the demonstration of additionality of small-scale project activities" (version 09.0)
https://cdm.unfccc.int/Reference/Guidclarif/meth/methSSC_guid05.pdf

E.2. Justification of the choice of the methodology and why it is applicable to a SSC-CPA:

As also described in A4.2.2 eligibility criteria, AMS-II.D (Version 12) is applicable to the CPA as shown in the following Table E.2.

Table E.2 Applicability check

No	Applicability conditions of the methodology	Conditions of the CPA	Applicability Check
1	This category comprises any energy efficiency and fuel switching measures implemented at a single or several industrial or mining and mineral production facility(ies). This category covers project activities aimed primarily at energy efficiency; a project activity that involves primarily fuel switching falls into category III.B	The CPAs under the PoA will be aimed primarily at energy efficiency and comprises BRST implemented at a single or several ceramic kilns.	Applicable
2	The measures may replace, modify or retrofit existing facilities or be installed in a new facility.	The CPAs under the PoA may replace, modify or retrofit existing kilns using BRST or install BRST in a new kiln.	Applicable
3	This category is applicable to project activities where it is possible to directly measure and record the energy use within the project boundary (e.g., electricity and/or fossil fuel	The energy used for the kilns can and will be directly measured and recorded within the CPA boundary.	Applicable

	consumption).		
4	This category is applicable to project activities where the impact of the measures implemented (improvements in energy efficiency) by the project activity can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity (signal to noise ratio).	The impact of the measures implemented by the CPA can be clearly distinguished from changes in energy use due to other variables not influenced by the project activity.	Applicable
5	The aggregate energy savings of a single project (inclusive of a single facility or several facilities) may not exceed the equivalent of 60 GWhe per year. A total saving of 60 GWhe per year is equivalent to a maximal saving of 180 GWh_{th} per year in fuel input.	The aggregate energy savings of a single CPA (inclusive of a single facility or several facilities) do not exceed the equivalent of 180 GWh_{th} per year in fuel input.	Applicable

E.3. Description of the sources and gases included in the SSC-CPA boundary

>>

As per the AMS II.D (Version 12), the project boundary is the physical, geographical site of the industrial or mining and mineral production facility(ies), processes or equipment that are affected by the project activity.

For this PoA, each CPA boundary is the physical, geographical site of the kilns affected by the CPA. GHG emission sources taken into account in the project activity are shown in the table E.3.1

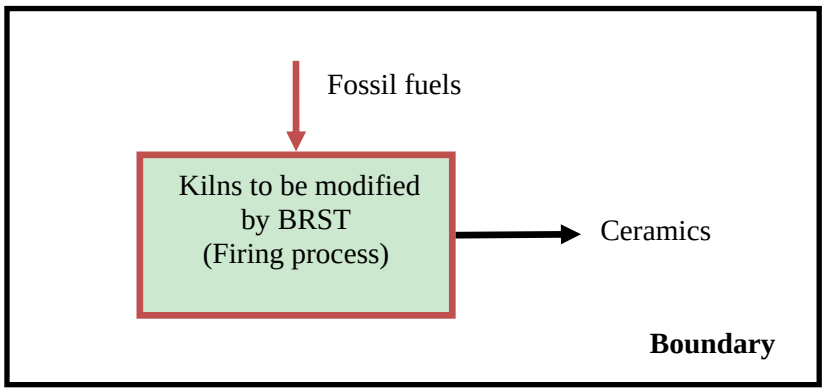


Fig. E.3.1 The boundary of each SSC-CPA.

Table E.3.1 GHG emission sources related to the project activity

Source		Gas	Included?	Justification / Explanation
Baseline	Fossil fuel consumption in the kilns	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.
Project Activity	Fossil fuel consumption in the kilns	CO_2	Yes	Main emission source
		CH_4	No	Excluded for simplification. This is conservative.
		N_2O	No	Excluded for simplification. This is conservative.

E.4. Description of how the baseline scenario is identified and description of the identified baseline scenario:

>>

As per the methodology AMS II.D (version 12) Paragraph 7, *"in the case of replacement, modification or retrofit measures, the baseline consists of the energy baseline of the existing facility or sub-system that is replaced, modified or retrofitted."* Therefore, if the CPA is replacing, modifying or retrofitting existing kilns, the baseline is the energy baseline of the existing kilns that is replaced, modified or retrofitted.

As per the methodology AMS II.D (version 12) Paragraph 7, *"For new facilities and project activities involving capacity additions, the energy baseline consists of the facility that would otherwise be built; the most plausible baseline scenario for the project activity shall be evaluated based on the related and relevant requirements in the General Guidance for SSC methodologies."* Therefore, if the CPA is new facilities[8] or involves capacity additions, the energy baseline is the facility that would otherwise be built (i.e. traditional kilns). This will be demonstrated according to "General Guidelines to SSC CDM methodologies" (version17) paragraph 19 and 21.

Step 1: *Identify the various alternatives available to the project proponent that deliver comparable level of service including the proposed project activity undertaken without being registered as a CDM project activity.*

For providing the same production level as that provided by the CPA, the realistic and credible alternative(s) include:

Alternative I: Purchase normal kilns which are adopted by most of the ceramic plants;
Alternative II: Purchase kilns using BRST (i.e. the proposed CPA without being registered as CDM activity).

Step 2: *List the alternatives identified per Step 1 in compliance with the local regulations (if any of the identified baseline is not in compliance with the local regulations, then exclude the same from further consideration).*

Alternative I: Purchase normal kilns which are adopted by most of the ceramic plants. This complies with local regulations and this is common practice in local area.

Alternative II: Purchase kilns using BRST (i.e. the proposed CPA without being registered as CDM activity) which is relatively advanced technology but not economically viable, also in compliance with local regulations.

Step 3: *Eliminate and rank the alternatives identified in Step 2 taking into account barrier tests specified in attachment A to Appendix B of the simplified modalities and procedures of SSC CDM.*

As per "Guidelines on the demonstration of additionality of small-scale project activities" (version 09.0, EB68), "Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:" (a) Investment barrier; (b) Technological

[8] Green-field

barrier; (c) Barrier due to prevailing practice; (d) Other barriers.

As mentioned in the eligibility criteria, each CPA shall prove through investment analysis that the CPA would not occur in the absence of CDM because of investment barrier. Thus, alternative II face investment barrier and shall be eliminated.

Step 4:
If only one alternative remains that is:
• Not the proposed project activity undertaken without being registered as a CDM project activity; and
• It corresponds to one of the baseline scenarios provided in the methodology; then the project activity is eligible under the methodology.

After the analysis, only alternative I exists. Thus, in case of new facilities and project activities involving capacity additions, the energy baseline scenario is the traditional kilns which otherwise be built.

In sumary, if the CPA is replacing, modifying or retrofitting existing kilns, the baseline is the energy baseline of the existing kilns that is replaced, modified or retrofitted. For new facilities and project activities involving capacity additions, the energy baseline is the traditional kilns that would otherwise be built.

E.5. Description of how the anthropogenic emissions of GHG by sources are reduced below those that would have occurred in the absence of the SSC-CPA being included as registered PoA (assessment and demonstration of additionality of SSC-CPA): >>

E.5.1. Assessment and demonstration of additionality for a typical SSC-CPA:

As per "Guidelines on the demonstration of additionality of small-scale project activities" (version 09.0, EB68), "Project participants shall provide an explanation to show that the project activity would not have occurred anyway due to at least one of the following barriers:" (a) Investment barrier; (b) Technological barrier; (c) Barrier due to prevailing practice; (d) Other barriers.

In this PoA, individual CPA will adopt investment analysis to demonstrate the CPA would not have occurred due to investment barrier.

For green-field project, investment comparison analysis can be adopted. Whether to invest the proposed CPA or other alternatives is determined by comparison of their individual financial indicators (e.g. NPV, IRR). If the financial indicator chosen of the proposed CPA is disadvantaged, the investors have no incentive to invest and such CPA is unlikely to happen.

For project involving replacing, modifying or retrofitting existing kilns, benchmark analysis can be adopted. Whether to implement the CPA or to maintain the existing (normal) kilns is determined by comparing the IRR of the CPA without CER revenue with the benchmark. If the IRR of the CPA without CER revenue is lower than the benchmark, the investors have no incentive to invest and such CPA is unlikely to happen.

The discounting rate or financial benchmark can be taken from the latest version of official publication "Economic evaluation measurements and parameters of constructive projects", which offers an appropriate guide. Application of such benchmark complies with the item 12 of the "Guidance on the

Assessment of Investment Analysis"[9]. For ceramic industry, projects with the return rate below the benchmark are not attractive. And the operation of the CPA is closely linked to ceramic production and has same risk as that of ceramic production. Therefore, the appointed benchmark covers the potential risks of the CPA.

Thus, this CPA face investment barrier and additionality can be proved.

To verify the consistency of the investment analysis, a sensitivity analysis will be undertaken. According to "Guidelines on the assessment of investment analysis" (Version 05) paragraph 20 and 21, *"Only variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation", "As a general point of departure variations in the sensitivity analysis should at least cover a range of +10% and -10%, unless this is not deemed appropriate in the context of the specific project circumstances."* In those CPAs, for example, variables such as fuel price, total investment, and annual O&M cost shall be subjected to reasonable variation. The variations should at least cover a range of +10% and -10%.

An example (CPA-001) of additionality demonstration is shown as follows,

1 Investment analysis

The financial indicator chosen should be calculated based on all critical techno-economic parameters and assumptions. The key parameters and assumptions upon which the calculation is based are provided in Table E.5.1.1.

Table E.5.1.1 Basic parameters of investment analysis

No.	Item	Unit	Source
1	Total investment	10,000RMB	FSR
1.1	Investment on fixed asset	10,000RMB	FSR
1.2	Working capital	10,000RMB	FSR
2	Annual cost	10,000RMB/yr	FSR
2.1	Labor cost and welfare	10,000RMB/yr	FSR
2.2	Administration cost	10,000RMB/yr	FSR
2.3	Maintenance cost	10,000RMB/yr	FSR
2.4	Overhaul cost	10,000RMB/yr	FSR
2.5	Insurance cost	10,000RMB/yr	FSR
2.6	Depreciation cost	10,000RMB/yr	FSR
2.6.1	Salvage value	%	FSR
2.6.2	Period of depreciation	years	FSR
3	Annual financial Revenue	10,000RMB/yr	FSR
3.1	Coal gas cost saving	10,000RMB/yr	FSR

[10] Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (EB41,annex11 formula 2)

3.2	CER revenue	10,000RMB/yr	FSR
4	Tax	%	FSR
4.1	VAT	%	FSR
4.2	Urban construction tax and educational surtax	% of VAT	FSR
4.3	Corporate tax	%	FSR

If the financial indicator of the proposed CPA is disadvantaged (to benchmark or that of other alternative), the proposed CPA faces investment barrier that prevent to happen.

2 Sensitivity analysis

A sensitivity analysis should be carried out for the impact of the parameters on the IRR (without CER revenues). Fluctuation of the parameters' value are ranged between -10% to +10%. As per *Guidelines on the assessment of investment analysis*, only the variables, including the initial investment cost, that constitute more than 20% of either total project costs or total project revenues should be subjected to reasonable variation. No matter how the above parameters change within -10% ~ 10%,
the financial disadvantage is not reversed, then it can be proved that the project is not financially attractive without CDM financing and the conclusion regarding the financial/economic attractiveness is robust.

E.5.2. Key criteria and data for assessing additionality of a SSC-CPA:

To demonstrate the CPA additionality, the following criteria and data shall be complied,

1 Each CPA shall prove through investment analysis that the CPA would not occur in the absence of CDM because of investment barrier, according to "Guidelines on the demonstration of additionality of small-scale project activities" (version 09.0, EB68).

For investment comparison analysis, the financial indicators (e.g. NPV, IRR) of the proposed CPA (without CDM revenue) shall be below that of other alternatives.

For benchmark analysis, the IRR of the proposed CPA (without CDM revenue) shall be below the benchmark.

The discounting rate or financial benchmark can be taken from the latest version of official publication "Economic evaluation measurements and parameters of constructive projects", which offers an appropriate guide.

2 Basic parameters such as initial investment, O&M cost, and energy saving revenue for the calculation of cash flow shall have several reliable sources and can be crosschecked.

3 Sensitivity analysis shall be conducted for variables such as fuel price, total investment, and annual O&M cost. The variations should at least cover a range of +10% and -10%.

4 Adopting BRST for ceramic kilns is not mandatory in Liaoning Faku Economic Development Zone.

E.6. Estimation of Emission reductions of a CPA:

E.6.1. Explanation of methodological choices, provided in the approved baseline and

monitoring methodology applied, selected for a typical SSC-CPA:

The following methodology and tools are applied,

AMS-II.D. Energy efficiency and fuel switching measures for industrial facilities (Version 12)
Available at
http://cdm.unfccc.int/methodologies/SSCmethodologies/approved.html

Tool to calculate project or leakage CO2 emissions from fossil fuel combustion (Version 02)
Available at
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-03-v2.pdf/history_view

Tool to determine the remaining lifetime of equipment (Version 01)
http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-10-v1.pdf/history_view

E.6.2. Equations, including fixed parametric values, to be used for calculation of emission reductions of a SSC-CPA:

The emission reduction achieved by energy efficiency is estimated according to the AMS-II.D (Version 12).

According to the AMS-II.D (Version 12), "*In the absence of the CDM project activity, the existing facility(ies) would continue to consume energy (EC_{BL} in GWh/year) at historical average levels (EC_{HY} in GWh/year), until the time at which the industrial or mining and mineral production facility(ies) would be likely to be replaced, modified or retrofitted in the absence of the CDM project activity ($DATE_{BaselineRetrofit}$). From that point of time onwards, the baseline scenario is assumed to correspond to the project activity, and baseline energy consumption (EC_{BL}) is assumed to equal project energy consumption ($EC_{PJ,y}$ in GWh/year), and no emission reductions are assumed to occur.*"

$EC_{BL} = EC_{HY}$ until $DATE_{BaselineRetrofit}$
$EC_{BL} = EC_{PJ,y}$ on/after $DATE_{BaselineRetrofit}$

Each energy form in the emission baseline is multiplied by an emission coefficient (in kg CO_2e/kWh). For the electricity displaced, the emission coefficient is calculated in accordance with provisions under category I.D. For fossil fuels, the IPCC default values for emission coefficients may be used.

As to the CPA, the main energy is thermal energy, such as coal gas, natural gas, coal and so on. So the unit of energy consumption and its emission coefficient applies TJ/year and t CO2e/TJ respectively in the PoA DD and CPA DD for the calculation convenience.

Baseline Emissions:

$BE_y = EC_{BL} \times COEF_{i,y}$ (1)
$EC_{BL} = EC_{HY}$ until $DATE_{BaselineRetrofit}$ (2)
$EC_{BL} = EC_{PJ,y}$ on/after $DATE_{BaselineRetrofit}$ (3)

Where,

BE_y	Baseline emission in year y (tCO2e/year).
EC_{BL}	Baseline energy consumption (GWh/year)
EC_{HY}	Energy consumption at historical average levels(GWh/year)
$EC_{PJ,y}$	Project energy consumption in year year (GWh/year)
$DATE_{Baseline\ Retrofit}$	The time when the kilns (or kilns to be built for greenfield project) would be likely to be replaced, modified or retrofitted in the absence of the CDM project activity.
$COEF_{i,y}$	The CO_2 emission coefficient of fuel type i in year y (t CO_2e/GWh). For fossil fuels, the IPCC default values for emission coefficients may be used, or the following equation can be applied for calculation.

$$COEF_{i,y} = w_{C,i,y} / NCV_{i,y} \times 44/12 \times 3600 \quad (4)$$ [10]

$w_{C,i,y}$	The weighted average mass fraction of carbon in fuel type i in year y (kg C/ t or m^3).
$NCV_{i,y}$	The net calorific value of the fuel type i in year y (MJ/ t or m^3).
44&12	Molecular weight of carbon dioxide (CO_2) and carbon (C) respectively.

$$EC_{HY} = EC_{UnitBL,i} \times M_y \quad (5)$$

$EC_{UnitBL,i}$	The baseline energy consumption of fuel type i per unit ceramics production at historical level (or historical level of other similar plant, for greenfield projects) (GWh / t or m^2 ceramics);
M_y	The quantity of ceramic production during the year y (t or m^2 ceramics /year);

Project Emission

The project emission is calculated according to the following equations.

$$PE_y = EC_{PJ,y} \times COEF_{i,y} \quad (6)$$

$$EC_{PJ,y} = FC_{PJ,i,y} \times NCV_{i,y}/3600/1000 \quad (7)$$

PE_y	Project emissions in the year y (tCO2e / year)
$EC_{PJ,y}$	Energy consumption during the year y (GWh/year);
$COEF_{i,y}$	The CO_2 emission coefficient of fuel type i in year y (tCO_2e/ GWh). It is derived through the same way as that for ex-ante.
$FC_{PJ,i,y}$	Fuel type i consumption in the year y (t or m^3/ year)
$NCV_{i,y}$	Net calorific value of the fuel type i in year y (MJ/ t or m^3).

Leackage:

According to paragraph 11 of AMS-II.D (version 12), “If the equipment currently being utilised is transferred from outside the boundary to the project activity, leakage is to be considered.” As per eligibility criteria e.7, for this PoA, the equipment currently being utilised shall not be transferred from

[10] Tool to calculate project or leakage CO_2 emissions from fossil fuel combustion (EB41,annex11 formula 2)

outside the boundary to the project activity, thus leakage is deemed to be zero.

According to paragraph 14 of AMS-II.D (version 12), "In case the project activity involves fossil fuel switching measures leakage resulting from fuel extraction, processing, liquefaction, transportation, re-gasification and distribution of fossil fuels outside of the project boundary shall be considered as per the guidance provided in the leakage section of the most recent version of the large scale approved methodology ACM0009. In case leakage emissions in the baseline situation are higher than leakage emissions in the project situation, leakage emissions will be set to zero." As per eligibility criteria e.7, for this PoA, the CPA shall not involve fossil fuel switching measures. If involved, the leakage emissions in the baseline situation shall be higher than leakage emissions in the project situation. Hence, leakage emissions can be set to zero.

According to paragraph 15 of AMS-II.D (version 12), "In case the project activity involves the replacement of equipment, and the leakage effect of the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped, an independent monitoring of scrapping of replaced equipment needs to be implemented." As per eligibility criteria e.7, for this PoA, in case the CPA involves the replacement of equipment, the replaced equipment shall be scrapped and the leakage effect can be neglected.

Emission Reduction

$$ER_y = BE_y - PE_y - LE_y \quad (8)$$

ER_y Emission Reduction in the year y (t CO2e / year)
BE_y Baseline emission in year y (tCO2e/year).
PE_y Project emissions in the year y (tCO2e / year)
LEy Leakage in the year y (tCO2e / year)

Energy Saving

$$ES_y = EC_{BL} - EC_{PJ,y} \quad (9)$$

ES_y Energy saving in year y (GWh/year)
EC_{BL} Baseline energy consumption (GWh/year)
$EC_{PJ,y}$ Energy consumption in year y (GWh/year)

E.6.3. Data and parameters that are to be reported in CDM-SSC-CPA-DD form:

Data / Parameter:	$EC_{UnitBL,i}$
Data unit:	GWh per unit (t or m^2) ceramic product
Description:	the energy consumption of fuel type i per unit product produced at historical level
Source of data used:	Plant historical average data; for Greenfield projects, historical data of other similar plants shall be used.
Value applied:	See the CPA for details.
Justification of the choice of data or	Used to determine EC_{HR}. The energy consumption of ceramic

description of measurement methods and procedures actually applied :	plants may vary according to actual productivity (M_y). It is more appropriate to use $EC_{UnitBL,i}$ and actual productivity to determine the corresponding baseline energy consumption and emissions.
Any comment:	/

Data / Parameter:	$DATE_{BaselineRetrofit}$
Data unit:	year
Description:	the time when the kilns (or kilns to be built for greenfield project) would be likely to be replaced, modified or retrofitted in the absence of the CDM project activity
Source of data used:	According to specifications of "Tool to determine the remaining lifetime of equipment"
Value applied:	See the CPA for details.
Justification of the choice of data or description of measurement methods and procedures actually applied :	The three options below can be chosen determine the remaining lifetime of the equipment, Option (a): Use manufacturer's information for the technical lifetime of equipment and compare to the date of first commissioning Option (b): Obtain an expert evaluation Option (c): Use default values
Any comment:	/

Data / Parameter:	$COEF_{i,y}$
Data unit:	(t CO_2e/ GWh)
Description:	The CO_2 emission coefficient of fuel type i in year y
Source of data used:	The IPCC default values may be used, or, the equation (4) conditioned in E.6.2 can be applied for calculation.
Value applied:	See the CPA for details.
Justification of the choice of data or description of measurement methods and procedures actually applied :	/
Any comment:	/

E.7. Application of the monitoring methodology and description of the monitoring plan:

E.7.1. Data and parameters to be monitored by each SSC-CPA:

Data / Parameter:	M_y
Data unit:	t or m^2 ceramics /year
Description:	The quantity of ceramic production during the year y
Source of data used:	Monitored by CPA implementer
Value of data applied for the purpose of calculating expected emission reductions in section B.5	See the CPA for details.
Description of measurement methods and procedures to be applied:	Use scale to measure the mass quantity of ceramics or count the number of ceramics to calculate the quantity of ceramics in m^2
QA/QC procedures to be applied:	/

Any comment:	/

Data / Parameter:	$FC_{PJ,i,y}$
Data unit:	t or m3 / year
Description:	The quantity of fuel type i combusted during the year y
Source of data used:	Monitored by CPA implementer
Value of data applied for the purpose of calculating expected emission reductions in section B.5	See the CPA for details.
Description of measurement methods and procedures to be applied:	Use either mass or volume meters. In cases where fuel is supplied from small daily tanks, rulers can be used to determine mass or volume of the fuel consumed, with the following conditions: The ruler gauge must be part of the daily tank and calibrated at least once a year and have a book of control for recording the measurements (on a daily basis or per shift); Accessories such as transducers, sonar and piezoelectronic devices are accepted if they are properly calibrated with the ruler gauge and receiving a reasonable maintenance; In case of daily tanks with pre-heaters for heavy oil, the calibration will be made with the system at typical operational conditions.
QA/QC procedures to be applied:	The consistency of metered fuel consumption quantities should be cross-checked by an annual energy balance that is based on purchased quantities and stock changes. Where the purchased fuel invoices can be identified specifically for the CDM project, the metered fuel consumption quantities should also be cross-checked with available purchase invoices from the financial records.
Any comment:	/

Data / Parameter:	$w_{C,i,y}$
Data unit:	tC/ t or m^3
Description:	Weighted average mass fraction of carbon in fuel type i in year y
Source of data used:	The following data sources may be used if the relevant conditions apply: Data source — Conditions for using the data source a) Values provided by the fuel supplier in invoices — This is the preferred source b) Measurements by the project participants — If a) is not available
Value of data applied for the purpose of calculating expected emission reductions in section B.5	See the CPA for details.
Description of measurement methods and procedures to be applied:	Measurements should be undertaken in line with national or international fuel standards. The mass fraction of carbon should

	be obtained for each fuel delivery, from which weighted average annual values should be calculated.
QA/QC procedures to be applied:	Verify if the values under a) and b) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range collect additional information from the testing laboratory to justify the outcome or conduct additional measurements. The laboratories in b) should have ISO17025 accreditation or justify that they can comply with similar quality standards.
Any comment:	Applicable where equation (4) in E.6.2 is used.

Data / Parameter:	$NCV_{i,y}$
Data unit:	GJ per mass or volume unit (e.g. GJ/m³, GJ/ton)
Description:	Weighted average net calorific value of fuel type i in year y
Source of data used:	The following data sources may be used if the relevant conditions apply:

Data source	Conditions for using the data source
a) Values provided by the fuel supplier in invoices	This is the preferred source if the carbon fraction of the fuel is not provided (Option A)
b) Measurements by the project participants	If a) is not available
c) Regional or national default values	If a) is not available
d) IPCC default values at the upper limit of the uncertainty at a 95% confidence interval as provided in Table 1.2 of Chapter 1 of Vol. 2 (Energy) of the 2006 IPCC Guidelines on National GHG Inventories	If a) is not available

Value of data applied for the purpose of calculating expected emission reductions in section B.5	See the CPA for details.
Description of measurement methods and procedures to be applied:	For a) and b): Measurements should be undertaken in line with national or international fuel standards. The NCV should be obtained for each fuel delivery, from which weighted average annual values should be calculated. For c): Review appropriateness of the values annually For d): Any future revision of the IPCC Guidelines should be taken into account
QA/QC procedures to be applied:	Verify if the values under a), b) and c) are within the uncertainty range of the IPCC default values as provided in Table 1.2, Vol. 2 of the 2006 IPCC Guidelines. If the values fall below this range collect additional information from the testing laboratory to

	justify the outcome or conduct additional measurements. The laboratories in a), b) or c) should have ISO17025 accreditation or justify that they can comply with similar quality standards.
Any comment:	Applicable where equation (4) in E.6.2 is used. And for calculation of project emissions.

Data / Parameter:	Independent monitoring of scrapping of replaced equipment
Data unit:	/
Description:	/
Source of data used:	Monitored by CPA implementer
Value of data applied for the purpose of calculating expected emission reductions in section B.5	See the CPA for details.
Description of measurement methods and procedures to be applied:	The monitoring should include a check if the number of project activity equipment distributed by the project and the number of scrapped equipment correspond with each other. For this purpose, scrapped equipment should be stored until such correspondence has been checked. The scrapping of replaced equipment should be documented and independently verified.”
QA/QC procedures to be applied:	/
Any comment:	In case the project activity involves the replacement of equipment, and the leakage effect of the use of the replaced equipment in another activity is neglected because the replaced equipment is scrapped.

E.7.2. Description of the monitoring plan for a SSC-CPA:

The purpose of the monitoring plan is to provide a standard by which CME will conduct monitoring and verification of the proposed CPA. The monitoring plan will be in accordance with all the CDM relevant rules and regulations. The monitoring plan will facilitate accurate and consistent monitoring of the emission reduction. CME will use the monitoring plan for the duration of the Programme activity and will refine and expand it from time to time if any require. During implementation, CME will be responsible for organizing and supervising all of the monitoring activities required for accurate and timely verification and reporting of the CERs.

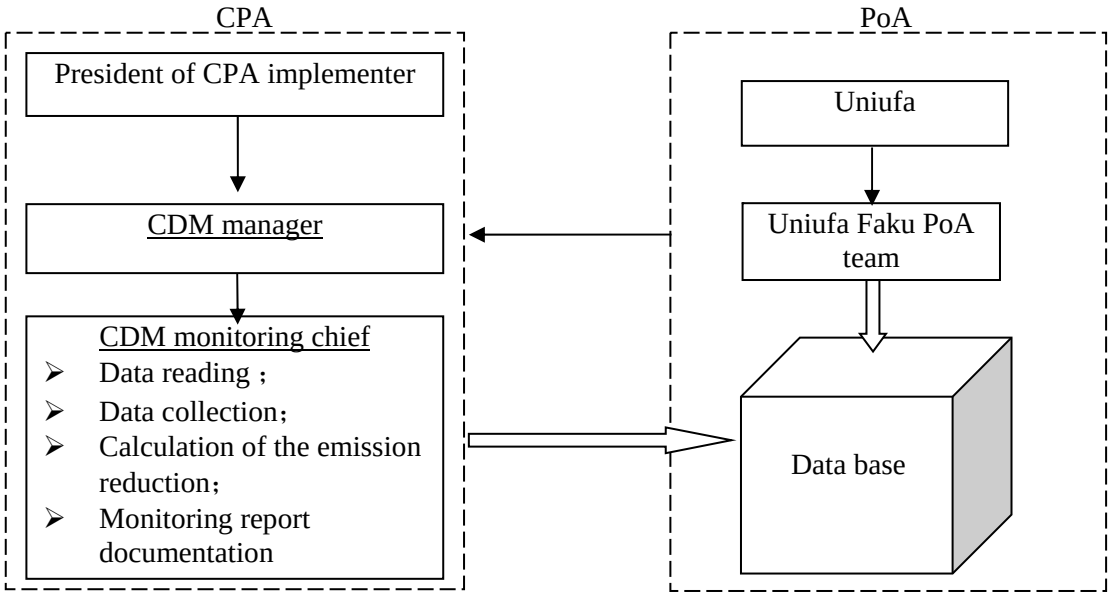
1. Monitoring organization

Implementation of the monitoring plan is to ensure real, measurable, long-term greenhouse gas emissions reduction. It is a crucial procedure to identify the final CERs of the proposed project. This monitoring plan for the proposed project activity will be implemented by individual CPAs implementer with the technical support from CME.

The president of CPA implementer will appoint one CDM monitoring manager and several CDM monitoring staff. The original records and electronic copy will be kept by The CDM monitoring group of CPA. CME will keep the copy of original records and electronic data.

The CDM monitoring manager and CME will make the CDM monitoring staff understand the importance of monitoring for the CDM project activity as well as instruct technical matters such as how to use,

maintain and calibrate monitoring equipment (including on-site training), procedure for error detection, data processing for calculation of emissions reductions, data archiving system (storage media, frequency of recording and backup, etc.), preparation of internal monitoring report and data entry method.



2. Monitoring parameters and equipment

According to paragraph 12 of AMS-II.D (version 12), In the case of replacement, modification and retrofit measures the monitoring shall consist of:

(a) Documenting the specifications of the equipment replaced; There will be no equipment be replaced but only modified or retrofitted. So this is not applicable to the CPAs.

(b) Metering the energy use of the industrial or mining and mineral production facility, processes or the equipment affected by the project activity; The energy consumption of affected individual kiln will be measured by meters or scales ($FC_{PJ,i,y}$). And the NCV of fuel type i ($NCV_{i,y}$) and ceramic production (M_y)are to be measured.

(c) Calculating the energy savings using the metered energy obtained from sub-paragraph (b).

In the case of project activities involving several facilities, the monitoring procedure as described above shall apply for each facility.

Each CPA may monitor the following parameter where the equation (4) in section E.6.2 is used.

- The carbon content of the fossil fuels can be, either provided by fuel supplier or measured through laboratory analysis or analysers.($w_{c,i,y}$)

Monitoring equipment and installation will be designed according to the actual situation of each CPA.

3. Data collection

The CDM monitoring staff will implement data reading and periodical recording. The CDM monitoring staff shall implement maintenance, calibration and necessary repair of monitoring equipment. The staff is

also responsible for periodical reporting of monitoring result to the CDM monitoring manager. The monitoring data mainly include coal consumption, ceramic production and electricity consumption.

CDM manager is in charge of monitoring report, including:

- Compare and calculate the data need measured in the monitoring plan;
- Identify the errors such as typing error and mistakes in digit and unit and made necessary correction.

4. Data Management

Data monitored for CDM purposes will be aggregated, summarized, calculated and recorded as an electronic file at the end of every month. Backup is saved in a digital recording media like CD and as printed out. All relevant documents such as maps, drawings, applicable standards, monitoring guidance, etc. are systematically stored in order to use to check appropriateness of data and data management. The collected data and relevant documents will be made available to the verifier so that the reliability of the information can be checked. All the data shall be kept and archived electronically for two years after the end of crediting period or the last issuance of CERs, whichever occurs later.

5. Quality Assurance and Quality Control

All monitoring equipment will be maintained and calibrated in line with manufacturers' instruction or national standards. Calibration will be implemented at least once a year. These activities will assure that the equipment operates at the stated level of accuracy.

6. Monitoring Report

At the end of the year, the CME shall instruct the CPA owner prepare a monitoring report for verification by DOE. The monitoring report includes monitoring data such as specified in Table E.7.1.

E.8 Date of completion of the application of the baseline study and monitoring methodology and the name of the responsible person(s)/entity(ies)

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Date of completion: 31/10/2012

Name of responsible persons: Peng Zhang, Shengsheng Jin, Haijiang Tian

Telephone: 86-10-84505948

Fax: 86-10-84505948

Email: zp@uniufa.com , jss@uniufa.com, thj@uniufa.com

Entity name: Beijing Uniufa Energy Technology Co., Ltd.

Address: Room A5000 Yan Dong Office Building, No. 2 Wan Hong West Street, Chao Yang District, Beijing China

Annex 1

CONTACT INFORMATION ON COORDINATING/MANAGING ENTITY AND PARTICIPANTS IN THE PROGRAMME OF ACTIVITIES

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Annex 2

INFORMATION REGARDING PUBLIC FUNDING

THE CPA WILL NOT RECEIVE ANY PUBLIC FUNDING FROM ANNEX I COUNTRIES.

ANNEX 3

BASELINE INFORMATION

No additional baseline information.

Annex 4

MONITORING INFORMATION

No other additional information.

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