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Your reference/letter of	Our reference/name	Tel. extension/E-mail	Fax extension	Date/Document	Page
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Under Review

Dear Sirs,

Please find below the response to the review formulated for the CDM project with the registration number 1674. In case you have any further inquiries please let us know as we kindly assist you.

Yours sincerely,

Javier Castro
Carbon Management Service

Industrie Service

Response to the CDM Executive Board

Issue 1

The DOE is requested to confirm how it has validated that the project is additional based on the results of the investment analysis, in particular with reference to the applied benchmark.

AND

Issue 2

Further clarification is required on how the DOE has validated the suitability of the input values, as per the guidance of EB 38 paragraph 54(c).

AND

Issue 3

Further clarification is required on (a) how the DOE has validated the investment barrier, (b) the number of similar projects using domestic technology cited in the common practice analysis and the essential differences between them and the project activity and (c) why the PP has not opted to use the domestic technology for the project activity.

AND

Issue 4

If the barriers to the project activity cannot be further substantiated, an economic comparison of the proposed baseline and the project activity without CDM must be conducted to determine the baseline.

AND

Issue 5

The DOE is requested to confirm how it can be validated that the total venting of waste heat and importation of electricity is a credible baseline in the context of the prevailing practice with regard to waste heat utilization in similar cement clinker production facilities.

Referring to Issue 1

Response by Project Participant:

The project demonstrates additionality through a benchmark analysis using the company benchmark as the means of comparison. The benchmark has been selected and applied in accordance with the additionality tool, the further guidance from EB 39 Annex 35 and national guidance on investment appraisal.

Evidence for the benchmark has been audited through the use of publically available data in the calculation of the WACC as well as providing an official company policy document on investment appraisal.

The selection of the benchmark for this project is therefore in compliance with all relevant national and international standards and must be considered appropriate and correct. These points are further elaborated below.

---Compliance with the Guidance on the Assessment of Investment Analysis (EB 39 Annex 35)

Since the project was submitted additional guidance has been issued by the EB at EB39 (annex 35). Paragraph 12 of this guidance states the following.

Guidance: *Internal company benchmarks/expected returns (including those used as the expected return on equity in the calculation of a weighted average cost of capital - WACC), should only be applied in cases where there is only one possible project developer and should be demonstrated to have been used for similar projects with similar risks, developed by the same company or, if the company is brand new, would have been used for similar projects in the same sector in the country/region. This shall require as a minimum clear evidence of the resolution by the company's Board and/or shareholders and will require the validating DOE to undertake a thorough assessment of the financial statements of the project developer - including the proposed WACC - to assess the past financial behavior of the entity during at least the last 3 years in relation to similar projects.*

Rationale: *Paragraph 4 of the Tool for the demonstration and assessment of additionality (version 3) requires that benchmarks should not include the subjective profitability expectations or risk profile of a particular project developer.*

In response to this new guidance, the Project Participant presents the following:

1) "Only one possible project developer"

Jiande Conch Cement Company Limited (JCCCL) is the only potential developer. JCCCL is subordinated to Anhui Conch Cement Company Limited (ACCCL) and investment decisions are made by ACCCL. The proposed project is an extension of a production process at an existing cement plant. The waste heat project is based on the existing production facility and only

Industrie Service

utilizes waste heat from that facility. As such the project is integrated into the core business of ACCCL and a third party investor would not be appropriate for this investment.

2) "assess the past financial behavior of the entity during at least the last 3 years in relation to similar projects"

Since 2003 all of the investments undertaken by ACCCL have had equity returns above the benchmark of 18% and therefore the same financial behaviour is demonstrated for more than 3 years. The Project Participant has supplied the IRRs of all previous investments to the DOE and the full list of investments that have been undertaken by ACCCL since 2003 and prior to the investment in Jiande Conch are shown below.

Year	**Project title**
2003	4000 t/d Clinker Cement Production Retrofit Engineering of Baimashan Conch Cement Company Limited
2003	10000 t/d Clinker Cement Production line Retrofit Engineering of Tongling Conch Cement Company Limited
2004	Phase III 2x4500t/d clinker line of Digang conch cement Company Limited
2004	1.65 million tone/a cement grinding line of Taizhou conch cement Company Limited
2004	Phase I 5000t/d clinker line of Wuhu conch cement Company Limited
2004	Phase I 2×5000t/d cement clinker line of Xuancheng conch cement Company Limited
2005	Phase I 4000t/d cement clinker line of Beiliu conch cement Company Limited
2005	4x4500 t/d Cement Clinker Production Retrofit project of Chizhou Conch Cement Company Limited
2005	Phase II 2×4500t/d Cement Clinker Production Retrofit project Wuhu Conch Cement Company Limited

This list includes both new build clinker lines and retrofit projects to existing clinker lines and all of these projects show returns higher than 18% (and indeed the more conservative benchmark of 17.86% used in the PDD). The IRRs range from 18% - 27%. Actual data has been omitted on request of ACCCL, but the FSR of this list of projects has been checked by the DOE and can be made available to the EB upon request.

3) "used for similar projects with similar risks"

The investments listed above include both similar projects (retrofit) and other projects (new clinker lines). All projects are required to meet the same financial returns in ACCCL. Furthermore, technologies that are not core business in ACCCL such as power generation from waste heat have much higher technology risk than those that are core business (clinker lines). As such the returns from projects that are not core business should be even higher.

4) "resolution by the company's Board and/or shareholders"

The internal benchmark applied in this project is required by the Board of Anhui Conch Cement Company Limited (ACCCL) and the resolution of the ACCCL Board that states this has been submitted to the DOE[1].

1 The resolution of the ACCCL Board on the Development Strategy of ACCCL during the Tenth Five-year Plan of China Social & Economic Development and the Company Internal Benchmark for the Investments

5) *"benchmarks should not include the subjective profitability expectations or risk profile of a particular project developer"*

In order to demonstrate the validity of this benchmark the Project Participant has calculated the weighted average cost of capital (WACC) in 2005 (the year that the investment decision was taken). This showed a WACC of 17.86%. Given that this is lower than the 18% specified by Conch, 17.86% this has been applied as the benchmark in the investment analysis to be conservative. The calculation of the WACC has been audited by the DOE and all data used is publically available. The benchmark is therefore not subjective but rather has been calculated in a fully transparent manner.

In conclusion the project in fully in compliance with the EB39 Annex 35 guidance.

---Compliance with the Tool for the demonstration and assessment of additionality (Version 03)

The following text is extracted from version 3 of the additionality tool.

Sub-step 2b – Option III. Apply benchmark analysis
The benchmark is to represent <u>standard returns in the market</u>, considering the specific risk of the project type, but not linked to the subjective profitability expectation or risk profile of a particular project developer. For example, benchmarks for IRR, NPV, etc<u>. can be derived from</u>:

(a) Government bond rates, increased by a suitable risk premium to reflect private investment and/or the project type, as substantiated by an independent (financial) expert;
(b) Estimates of the cost of financing and required return on capital (e.g. commercial lending rates and guarantees required for the country and the type of project activity concerned), based on bankers views and private equity investors/funds' required return on comparable projects;
(c) <u>A company internal benchmark (weighted average capital cost of the company) if there is only one potential project developer (e.g. when the project activity upgrades an existing process).</u>

The project developers shall demonstrate that this benchmark has been <u>consistently used in the past</u>, i.e. that project activities under similar conditions developed by the same company used the same benchmark.

1) "standard returns in the market"
The project participants have already demonstrated that the benchmark represents standard returns for ACCCL. ACCCL is the largest cement manufacturer in China and this alone should be sufficient to demonstrate that the returns from the projects within Conch are representative of standard returns in the market.

It should be noted at this point that whilst other project owners have selected to use published minimum benchmarks for the sector in their CDM applications in most cases these do not represent expectation of standard returns in the market. This is Government data and therefore not necessarily consistent with standard returns that may be achieved in the cement market.

To demonstrate this point the PDD also states:

"Outside of the ACCCL it can also be demonstrated that equity returns on cement production investments will be above 18% and more attractive than waste heat recovery projects. Project owners would therefore prefer to invest in new production, upgrade and restructuring rather than waste heat recovery. For example:

- *The 5500 t/d Clinker Production Line of Jiangshu United Cement Company Limited, equity IRR is 22.05%[2];*
- *The 2x4500t/d clinker production line of Tongshan Copper Mine, Tongling Nonferrous Metal Group, equity IRR is 23.69%[3];*
- *The 2x5000t/d clinker production line of Taiwan Cement (Yingde) Company Limited, equity IRR is 22.78%[4]; •*
- *The upgrade project of the 4000t/d clinker production line of Shanggao Hongshi Cement company Limited, equity IRR is 24.22%[5];*
- *The 4500t/d clinker production line with a new dry approach of Hezhou Datong Cement Limited, Hunan, equity IRR is 26.48%; [6]*
- *The 4500t/d clinker production lines of Huarun Cement (Pingnan) Company Limited, equity IRR is 19.87%[7]. "*

This list of projects was accessed by the Design Institute also responsible for the FSRs of ACCCL. It represents the complete list of projects during the period 2003 to 2006 from that institute. Given that it would be impossible to access market returns for all projects from all companies and design institutes this considered to be comprehensive enough to further demonstrate that the standard returns in the market are above the benchmark of 18%.

2) "can be derived from" "a company internal benchmark (weighted average capital cost of the company) if there is only one potential project developer (e.g. when the project activity upgrades an existing process)"

There is only one possible project developer as described above. It can be further clarified that the project is an upgrade to an existing process, which is further reason to substantiate that there is only one possible project developer. Therefore the benchmark can be derived from a company internal benchmark. Moreover as stated above the benchmark can be derived from the WACC. The benchmark selection is therefore permissible under the terms of this condition in the additionality tool.

Thus, the project in fully in compliance with the Tool for the demonstration and assessment of additionality (Version 03).

---Compliance with National Standards
In China, minimum investment benchmarks are published in the "Methods and Parameters for Financial Evaluation of Construction projects (3rd Edition)".

[2] FSR of 5500 t/d Clinker Production Line of Jiangshu United Cement Company Limited
3 FSR of 2x4500t/d clinker production line of Tongshan Copper Mine, Tongling Nonferrous metal Group,

4 FSR of 2x5000t/d clinker production line of Taiwan Cement (Yingde) Company Limited

5 FSR of Upgrading project with 4000t/d clinker production line of Shanggao Hongshi Cement Company

[6] FSR of 4500t/d clinker production line with a new dry approach of Hezhou Datong Cement Limited, Hunan
[7] FSR of 4500t/d clinker production lines of Huarun Cement(Pingnan) Company Limited

However, they are not a fair representation of what investors thresholds are in reality these are just guidance of minimum returns expected by the Government. Furthermore these benchmarks are for investment projects to be undertaken with Government funding or are in the Government's area of focus (sectors where products are priced by the Government and guided by government policies). These sectors include electricity, water supply, heat and gas supply, rail and airport[8].

ACCCL is not required to use these benchmarks for their investment decisions. Indeed, the book emphasizes that ***the published benchmarks are not necessarily suitable for private investors. In fact, the Methods and Parameters book states that private investors or other investors can determine their own benchmark based on their cost of capital and risk premium on particular investment project[9].***

ACCCL is therefore fully in compliance with the national rules for benchmark determination and has applied the WACC as suggested by the guidance for private investors.

Suitability of the Benchmark
Anhui Conch Cement Company limited (ACCCL) is a listed Company. ACCCL was established in 1997 and was listed in 2002 on the Shanghai Stock Exchange and so has multiple shareholders. As such, its financing is from different capital channels that causes various costs of capital.

ACCCL therefore has a higher cost of equity than fully State Owned Enterprises or enterprises or projects which are supported by government funding in China. This is due to the fact that it has to satisfy the minimum equity costs required by shareholders with a higher cost of capital. As such, ACCCL must meet the minimum equity costs required by shareholders as well as the debt cost required by banks in order to continue to obtain financing for their investments.

As such, ACCCL has their own internal benchmark of 18% return on equity and this represents their cost of capital in 2003. This is documented by the resolution of the Board[10]. This resolution has been checked by the DOE. As described above at no time has ACCCL invested in projects below this threshold and as such it is demonstrated to be both suitable and appropriate to use this benchmark for all investments within ACCCL.

A Government published benchmark would not be appropriate as governments are much less risk averse than private and listed companies and will always have lower investment thresholds. These benchmarks would also not satisfy the shareholders of Conch and would put the profitability of the company at serious risk.

[8] P196, "Methodology and Parameters for Economical Appraisal of Construction Project", China Planning Publishing House (version
[9] P196, p197, p199 "Methodology and Parameters for Economical Appraisal of Construction Project", China Planning Publishing House (version 3)
[10] The Resolution of the ACCCL Board on the Development Strategy of ACCCL during the Tenth Five-year Plan of China Social & Economic Development and the Company Internal Benchmark for the Investments

Under no circumstances would Conch knowingly invest in projects with returns of 12% to 18%. Therefore, these projects would not have happened had ACCCL not believed that they would be eligible for CDM financing.

Whilst other projects have used the 12% benchmark for the purposes of CDM application this does not have any bearing on the decision that ACCCL took and under no circumstances would Conch have invested at such low returns.

In conclusion the benchmark is suitable for the project activity and meets all of the requirements of the CDM rules.

Response by TÜV SÜD:

In assessing the benchmark used in the investment analysis, TÜV SÜD has followed a 3-step approach:

Step 1: Assessment of the eligibility of the project participant to use WACC
According to "The guidelines on the Assessment of Investment Analysis, WACC should only be used in cases where there is only one possible project developer and should be demonstrated to have been used for similar projects, developed by the same company.
The project owner is Jiande Conch Cement Company Limited (JCCCL) subordinated to ACCCL and decision of investment is made by ACCCL. They are the only project developer, as the project is located at their plant side.
The project participant provided the DOE with an overview of the company investments since 2003. For all projects (from 2003 to 2005) mentioned above, the FSR has been checked and verified by TÜV SÜD. All investments, projects with similar risks/ lower risks and other ones have crossed the announced benchmark of 17.86%. We are of the opinion that since project is not the core business of the company and has higher associated risks, so it is conservative to take the same benchmark applied to other projects in core business of the company.
The internal benchmark of 18% was decided in a board meeting of ACCCL dated on 19th January 2003. This document has been checked and validated by TÜV SÜD.
Therefore, the DOE can confirm, that the benchmark was continuously applied by the project developer.

Step 2: Assessment of the formulae used to calculate WACC
The formula has been taken from Rechard P. and Bill N. (2003) "Corporate Finance (fourth edition)", Prentice Hall and has been crosschecked with other financial definitions.
The formula can be considered as valid and applicable.

Step 3: Assessment of the Input values to WACC calculation
The equity and dept balance of Jiande Conch Cement Company Limited has been checked through the "Consolidated Balance sheet of Anhui Conch Cement Limited". The values applied in the calculation are consistent to them.
The shared market price has been evidenced through Yahoo stock market information „share price on 30th December 2005.
The dividends have been evidenced by the Yahoo stock market information „dividends paid over the period of 2002-2006".

By these procedures TÜV SÜD was able to confirm, that the benchmark applied is reasonable.

Compliance with the Guidance on the Assessment of Investment Analysis (EB 39 Annex 35)
The named requirements are the following:

- The project involves only one project developer
- The benchmark has been used for projects with similar risks
- The benchmark has been evidenced by the resolution by the company's Board
- The past financial behaviour of the entity, during at least the last three years has been assessed.
- The benchmark does not include subjective profitability expectations or risk profile of the project developer.

Following the discussion above and supporting the statement of the project participant, TÜV SÜD can confirm that all requirements are fulfilled. Hence the benchmark is in compliance with this guidance.

Compliance with the Tool for the demonstration and assessment of additionality (Version 03)

The named requirements are the following:

- The benchmark represents standard returns in the market.
- The benchmark derives from the company internal benchmark (weight average capital cost of the company (if there is, like in this case, only one project developer)
- It is demonstrated, that the benchmark has consistently been used in the past (from 2003~2005)

Following the discussion above and supporting the statement of the project participant, TÜV SÜD can confirm that all requirements are fulfilled. Hence the benchmark is in compliance with this guidance.

Compliance with National Standards

As ACCCL is a listed company and therefore has higher costs of equity than fully State Owned Enterprises, which is due to the requirements of the shareholders, the sector benchmark for cement industry is not the most appropriate benchmark for this project. Please also refer to „ Methods and Parameters for Financial Evaluation of construction projects (3rd edition)“.
On page 196, 197, 199 it is stated that the benchmarks are not always suitable for private investors and for sectors where the products are not governed by government.
And the private investors can determine their own benchmark based on their cost of capital and risk premium.

Even though similar project activities have applied published, government sectoral benchmark, it is not a requirement.
The additionality of every project should be considered on its own.

TÜV SÜD can confirm that the chosen benchmark is in compliance with all three guidelines (Additionality tool, Guidance on the Assessment of Investment Analysis and National Standards). Hence the benchmark is reasonable and appropriate.

In the IRR calculation submitted for registration the equity IRR was calculated. The equity IRR of the project is below the benchmark of 17.86%.

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Referring to issue 2:

Response by Project Participant:

The input values applied in the investment analysis are derived from the FSR of the project. The FSR was undertaken by Sinoma International Engineering Co., Ltd which is an independent design authority[11][12]. The FSR was approved by the government authority which is Zhejiang Province Development and Reform Commission[13][14].

The key input values taken from the FSR are detailed and evidenced as follows:

1 Total Investment[15]

1.1 Construction investment

	Value in FSR (Million RMB)
Construction Cost	**4.84**
Key Equipment Cost	**50.40**
- Imported	*22.55*
- Domestic	*27.85*
Installation Cost	**11.32**
Other Construction Engineering Costs (including land and other construction costs, duty and surcharge for imported equipments)	**12.13**
Basic Preparation Cost	**2.93**
TOTAL	**81.63**

The Installation and construction costs are in accordance with the guidance for Zhejiang province. The construction cost is estimated based on the guidelines for similar size WHR projects and the installation cost is estimated based on the guidelines for installation charges of similar size projects.

All purchase costs for domestic equipment refer to the factory price or quoted prices. The imported equipment cost is estimated based on the foreign manufacturer quoted price (C.I.F). As such, the key equipment cost in the equipment purchase agreements is very close to that in the FSR. In the FSR the cost estimate of the AQC boiler is 4.56 million RMB, the PH boiler is 22.54 million RMB and the Turbine generator is 11.155 million RMB respectively.[16] In the equipment purchase agreement, the cost of the turbine generator is 11.56 million RMB [17], the PH boiler is 31.34 million RMB(exchange rate is 8.1202RMB/100 JYP at the date of contract

[11] Qualification rank: A. No. Gongzijia 2031312004, issued by National Development and Reform Commission of P.R China
[12] FSR of Jiande WHR project
[13] No.Fagainengyuan<2005>818
[14] FSR Approval of Jiande WHR project
[15] Total investment estimate table,P45-46, FSR of Jiande WHR project
[16] P47,FSR of Jiande WHR project
[17] Purchase and Selling Contract for turbine generator

signed)[18] and AQC boiler is 4.78million RMB[19][20]. Actual capital cost of PH boiler is 8.79 million RMB higher than estimated cost of PH boiler in FSR. Also Actual costs of AQC boiler and turbine generator are above the estimates in FSR, therefore the input value of capital cost applied in FSR is very conservative.

The calculation of the duty, VAT, financing and surcharge for exchange rates has been done in accordance with the list of levied duty on import of equipments.

Other costs of construction engineering is estimated in accordance with the Budgetary Norm for Engineering Construction of Building Material sector (1992), issued by the State Building Material Bureau that gives reference to the specific situation of the proposed project.

The basic preparation cost is calculated as 6% of construction engineering cost (construction engineering includes construction cost, installation cost and other construction engineering costs)

1.2 Interest During Construction

The interest rate is 5.184% and the repayment period is 3 year[21]. This gives an interest during construction of 2.07 million RMB. This is derived from FSR and also with reference of the loan agreement.

1.3 Working Capital

Working capital is calculated as 0.02RMB/KWh, which equates to 1.4 million RMB. The actual working capital required was 0.04-0.05RMB/KWh[22.]

2. Power Tariff

The power tariff (inclusive) is 0.4796RMB/KWh in the FSR[23]. This is the purchase rate and therefore reflects the power cost savings. This rate is confirmed by the invoice of purchase of electricity by the project owner.[24]

Even though the tariff rate increased in 2006, it will certainly not affect the revenue from saving in the electricity as the tariff rate is priced by the government. The government increased tariff rate due to the rise of PI of operation cost of power generation such as material, transportation, interest rate of the loan etc. For example, NDRC raised power tariff rate normally due to the big increase in coal price, transportation and interest rate[25] Therefore, the actual net tariff rate will not change.

This also is demonstrated by the PI of material and labor, transportation compared to growth rate of tariff rate. From statistics compiled in the China Statistical Year Book over past 4 years,

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[18] http://www.boc.cn/cn/common/service.jsp
[19] Purchase and Selling Contract for AQC boiler
[20] Purchase and Selling Contract for PH boiler
[21] Loan agreement
[22] The explanation of demanded working capital over operation period
[23] P54, FSR of Jiande WHR project
[24] Invoice of purchase electricity ,
[25] The Notice on Adjustment for Tariff Rate of ECPG from NDRC, No.1230, fagaijia(2006)

it can be seen that in 2004, 2005 and 2006the national growth rate of purchase prices for raw materials, fuels and power are 11.4% and 8.3%6% respectively[26], average annual growth rate is 8.67% from 2004 to 2006. A broad overview is extended to ex-factory prices of industrial products and labor rate, there are the same up-trend. From 2004 to 2006, the ex-factory prices of industrial products increase by 6.1%, 4.9% and 3%[27] respectively; average annual growth rate is 4.67%. Labor rate increases even faster, growth rate amounts to 14.1%, 14.6%, and 14.4%[28], average annual growth rate is 14.37%. However, the average power tariff rate of Zhejiang province in 2004 is 0.5475RMB/kWh[29], and 0.569RMB/kWh in 2006, the average annual growth rate is 3.927% from 2004 to 2006. Therefore, the tariff rate applied in investment analysis is reasonable.

From the statistics, there is clearly a trend of increasing costs in the material, transportation and labor etc. Given a general trend for increasing prices and costs is much higher than growth of tariff rate. The net increase in tariff rate is impossible.

3 Power Generation

The average of operation hours of clinker line is 7680 hours. The power generation of the project is estimated in a basis of near full operation hours. This optimistic estimate gives a power generation of:

8.3MW x 7675 hours=63700 MWh[30]

The installed capacity and load factor are based on the most optimistic expectations of the project. This is unlikely to happen in reality and there are a number of reasons for this.

Firstly, the waste heat and smoke from the back of kiln contain large amounts of dust that accumulate on the face of boiler. This affects the heat efficiency of the boiler and therefore the amount of power generation.

Secondly, PH boilers have air leakage that can not only influence the heat efficiency but also the operation of the kiln and power consumption of cement production. Furthermore it may bring the kiln to a halt and therefore also the PH boilers operation[31].

This means that the power generation from the project cannot be expected to be at such high levels throughout its lifetime. This can be seen from the operation records from Ningguo phase I (a similar project funded by the Japanese government in 1998).

[26] 9.14 Indices of Purchasing Prices of Raw Materials ,Fuesls and Powers, China Statistical Year Book 2007 http://www.stats.gov.cn/tjsj/ndsj/2007/html/I0914e.htm
[27] 9.13 Ex-factory Price Indices of Industrial Products, China Statistical Year Book 2007 http://www.stats.gov.cn/tjsj/ndsj/2007/html/I0913e.htm
[28] 5-22 Indices of wage of Staff and Workers , China Statistical Year Book 2007http://www.stats.gov.cn/tjsj/ndsj/2007/html/E0522e.htm
[29] Selling price of Zhejiang province in 2004, The Notice on adjustment of tariff rate of Zhejiang province from NDRC. No.154,Zhejiangshang(2004) http://www.phdp.gov.cn/news/html/00200514200514161933.html
[30] P54, FSR of Jiande WHR project
[31] The development of SH boiler for pure lower waste heat system http://www.ccement.com/news/2006/5-19/C176954294.htm

The Actual installed capacity of Ningguo Phase I is 7200KW and the designed power generation is 55,296 MWh (7200KW x 7680hours). However, the operation record from 2000 to 2007 shows that the average operation hours of the kiln is 7660 hours. They also show that the operation of the WHR versus the kiln is 91.74%. The average capacity is 6699KW and the average power generation is 47160 MWh. This is 85.3% of the designed power generation and this was certainly known at the time of the investment decision although not corrected in the FSR.

Therefore, the power generation based on full workload being applied investment analysis in PDD is very conservative.

4 Operation Period[32]

The AQC and PH boilers are the key equipment of the proposed project. Therefore, the lifetime of the boilers determines the lifetime of the project. In general, the lifetime of the boiler is 10-15 years. Considering that the waste heat and smoke from the kiln that contains large amounts of dust, this is expected to lower the lifetime of the boiler and turbine generator.

The AQC boiler utilizes the waste heat and smoke gas from the front of the kiln and the PH boiler takes the waste heat and gas from the back of the kiln. When the parameters of waste heat and gas fluctuate, the two boilers influence each other. The adjustment in operation is very difficult. Furthermore, if the AQC boiler has a fault then either the whole power plant will stop operating or the cool water is fed into the PH boiler will be stopped. These effects cause wear of the PH boiler that impacts it's lifetime as well as causing safety problems[33].

Therefore, design institute adopts the 12-year lifetime in the proposed project in reference to the advice from the engineer of Ningguo phase I.

5 O & M cost 6.3m

The total O & M cost is 6.3m is broken down as follows:

[32] P54, FSR of Jiande WHR project
[33] http://www.ccement.com/news/2005/11-11/C1764869363.htm

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5.1 Operation Costs

Operation Cost	Value in FSR (RMB)
Material and water, power (utility cost)	**2,077,898**[34]
Chemical cost	**575,488**
- 35%HCL: 15.5t x 2500 RMB/t	*38,750 RMB*
- 35%NaOH:15.5t x 5800RMB/t	*89,900RMB*
- CL2 : 4.5t x 6000RMB/t	*27,000 RMB*
- HEDP: 10t x 16,500RMB	*165,000RMB*
- N2H4.H2O: 0.75t x 30,900RMB/t	*23,175RMB*
- C4H9NO: 2.375t x 47,500RMB/t	*112,813RMB*
- Na3PO4H2O: 13.5t x 5100RMB/t	*68,850RMB*
- other cost	*50,000RMB*
Water Cost (79x1.50x7675hours)	**910,000**
Consumption	t/h[35]
Water price	1.50RMB/t
Power Utility Cost (Charge by the grid company for connection to the grid)	**592,410**
Tariff rate	0.01RMB/KWh
Annual Net power generation	59,241 MWh

All of the above tariff rates are estimated in accordance with the average tariff rate of Zhejiang province in 2005. Indeed, the tariff rate of water for industrial consumption in Jiande city where the project located in 2005 is 2.15RMB/t[36] that makes a difference of 393,599 RMB (79x2.15x7675-910,000)

The actual power utility cost is much higher than estimated in FSR. The agreement for connection to the power grid shows that the actual power utility cost charged by the power grid company for the connection to the grid is 0.035 RMB/KWh[37] compared to 0.01 RMB/KWh.

Therefore the actual power utility cost is as follows:

59,241MWhx 0.035 RMB/KWh=2,073,345

This is 1,481,025 higher than the estimate. Therefore, the input value applied in the investment analysis of PDD is conservative.

5.2 Labour Cost[38]

The number of employees is 19 and the average salary and benefit per employee is 30,000RMB/year and therefore the total annual labor cost is 570,000 RMB.

[34] P55, FSR of Jiande WHR project
[35] P27, FSR of Jiande WHR project
[36] http://price.h2o-china.com/view.php?id=718&pid=715&ppid=716&nian=2005

[37] The Contract for Power Connection to the Grid
[38] P55, FSR of Jiande WHR project

The labor rate is estimated in accordance with the average rate of the cement plant in Anhui Province in 2005. The actual average salary and benefit per employee in the Conch Group is 490,00RMB/year in 2005, 54,600RMB in 2006 and 58,800RMB in 2007[39]. The difference is therefore 361,000RMB (19x49,000RMB-570,000)

5.3 Repairs and Maintenance cost

The annual repairs and maintenance cost is estimated as 3.02% of fixed assets investment and is given as 2,530,000 RMB.

5.4 Other O& M cost

Other O&M costs/overhead covers all management costs. This includes training cost, business cost, distribution cost, travel cost, entertainment, property tax, land tax, the share of board cost, cost of vehicles license, sewage treatment charge, green-built cost, insurance of assets, cost for legal advice, labor insurance, auditing charge, labor unit charge etc. It is calculated in 0.018RMB/KWh.

Power generation 63700MWh
Rate: 0.018 RMB/KWh

Total annual other O&M cost/overhead=63700MWh x 0.018=1,134,000

Comparison of key financial parameters for different types of Waste Heat Recovery projects[40]

The table below compares key parameters from the Jiande WHR project with other WHR projects in China. The primary source of data is from other projects available on the UNFCCC website (both submitted and registered).

[39] The statistics of employee's salary and benefit in ACCCL
[40] Attached Financial data

	Project	Unit Capital Cost (million RMB/MW)	Operation Hours (hour)	Unit O&M Cost (RMB/KWh)	Self Consumption (%)	Reference
1	Jiande conch WHR	10.04	7675	0.0995	7	FSR
2	Registered WHR projects	8.14	7048	0.2141	7.4	UNFCCC
3	Registered with corrections WHR projects	6.98	6853	0.1753	7.9	UNFCCC
4	Under review WHR projects	7.047	5624	0.2407	5.8	UNFCCC
5	Other projects prepared by the Sinoma Design Institute	6.651	5971	0.1893	7.6	see attached FSR

From the table it can be seen that the capital cost is a little bit higher comparable with the other WHR projects and however that the O&M cost is much lower. Furthermore the operation hours are much higher. The values used in the PDD are therefore both consistent and conservative.

Industrie Service

Response by TÜV SÜD

In assessing the input values used in the investment, TÜV SÜD has followed the following approach:

Assessment of the sources of the input parameters used in the investment analyses:
a) All the input parameters used in the financial analysis are taken from the feasibility study report (FSR), which was developed by Sinoma International Engineering Co., Ltd. SIMANO is accredited by relevant national authorities and has based its assumptions in line with national guidance.
This has been checked and verified during validation. The input parameters used in the financial analysis can thus be considered information provided by an independent and recognized source.

Confirmation that the values used in the PDD and investment analysis are fully consistent with the FSR
TÜV SÜD compared the input parameters for the financial analysis included in the PDD and investment analysis with the parameters stated in the FSR, and was able to confirm that the values applied are consistent with the sources.

Cross-check of the parameters used in the financial analysis with the parameters used by other similar projects
The input values have been validated by comparing the figures with statistical figures from 90 CDM Waste Heat Recovery projects in the Cement Industry (registered and under validation). Additionaly the input values have been cross-checked with actual invoices of the proposed project.
The specific investment costs of 10 Mio. RMB/MW is higher than the average of 7.5 Mio. RMB/MW of the statistics, but lower than the maximum of 14 Mio. RMB/MW of the statistics. The operational costs are 0.76 Mio. RMB/MW compared to 10 Mio. RMB/MW average. The grid tariff (excluding VAT) is higher than the average (0.351RMB/kWh versa 0.398 RMB/kWh). The operational hours are significantly higher than the average (7675 h versa 6379 h).

Total investment

The total investment has been crosschecked with available "purchasing contracts". The input value can be considered as plausible.

Power Tariff
The power tariff has been cross- checked by the Jiande tariff rate. The price of 0.479 RMB/kWh (incl. VAT) is consistent with the value applied in the FSR (2005). Hence the value is plausible and reasonable. According to the Notice on provincial grid selling price of electricity and price of transmission and distribution electricity in 2006, fagaijiage (2007)1521 issued by NDRC (see answer of project participant), the power tariff of the province of Zhejiang is 0.569 RMB/kWh, which is higher than the power tariff of the FSR.

With an increasing electricity tariff it is assumed, that the other input values, like investment costs and O&M costs will also rise. An increase of the electricity price will hike the IRR whilst an increase of O&M costs will lower them. Both parameters are disproportional to each other. And

if we consider the same inflation for the products, their increase will equal each other. It is realistic, that the electricity price will rise in the next years. But through the connected discount and inflation rate, it is likely that the O&M costs will rise in the same proportion.
Giving that scenario an increase of the electricity price will not lead to a different outcome of the investment analysis. The IRR will still be below the benchmark.

Power Generation

The operational hours of the project are estimated to be 7675 hours per year. That is equal to 320 days per year. Hence the project has 36 days a year for repair work or emergency shut downs. By applying our sectoral experience, TÜV SÜD can confirm that these values are very reasonable and plausible.

Taxes have been crosschecked with government requirements and can be considered as valid and applicable.
By additionally applying our sectoral competence and local expertise, TÜV SÜD was able to confirm that the input parameters used in the financial analysis are reasonable and adequately represent the economic situation of the project at the time of the final investment decision.

Referring to issue 3:

Response by Project Participant:

(a) Investment barriers

This principal mechanism for demonstration of additionality for this project is through the use of an investment analysis. As such the barrier analysis need not to be applied and the project participant agrees to the removal of this section.

(b) Domestic Technology in the Common Practice Analysis and the Essential Differences between them and the Project Activity

The common practice analysis has been undertaken for the East China Power Grid (ECPG).

The investment environment for each province in China is different. This is due to a variation of available natural resources (including coal), the economic development level, the industrial structure, the fundamental infrastructure, development strategy and the policy framework. These all affect the demand for products in terms of amount as well as the types of products and technologies.

As such a number of key economic factors vary from province to province. These include tariff rates of products, the cost of materials, the cost of electricity and other utilities such as water, the cost of labor and services and the types of loan that can be obtained. These all vary between provinces.

Therefore China cannot be considered to be a homogeneous country, but rather should be considered as a country made up of a number of "smaller countries" comparable in size and diversity to a "large European country".

By way of example the table below shows the variation of average selling price of electricity by each grid and average wage of workers for each province in 2006. These factors have a very strong influence on the project economics especially when there is such high variation.

Labor[41] and electricity rates in 2006[42]

	Average wages of staff and workers(RMB/year)	Selling price of electricity by each grid(RMB/MWh – including VAT and Transformer capacity Charge)
North East China Power Grid (NECPG)		
Liaoning	19624	508.55
Jilin	16583	485.62
Helongjiang	16505	482.22

[41] China statistical yearbook 2007
[42] The Notice on provincial grid selling price of electricity and price of transmission and distribution electricity in 2006, fagaijiage (2007)1521 issued by NDRC)

North China Power Grid (NCPG)		
Beijing	40117	525.22
Tianjin	28682	525.22
Hebei	16590	440.92
Shandong	19228	478.48
Shanxi	18300	408.68
Inner Mongolia	18469	
East China Power Grid (ECPG)		
Shanghai	41188	649.6
Jiangsu	23782	590.13
Zhejiang	27820	569.28
Fujiang	19318	490.13
Anhui	17949	503.37
North West China Power Grid (NWCPG)		
Shannxi	16918	420.74
Gansu	17246	356.65
Qinghai	22679	291.43
Ningxia	21239	358.72
Xinjiang	17819	417.13
Central China Power Grid (CCPG)		
Henan	16981	516.75
Hubei	16048	429.24
Hunan	17850	496.41
Jiangxi	15590	506.82
Chongqing	19215	465.76
Sichuan	17852	507.04
South China Power Grid		
Guangdong	26186	681.9
Guangxi	18064	449.7
Yunnan	18711	392.33
Guizhou	16815	377.29
Hainan Province	15890	615.23

This table shows the high degree of variation between provinces and there are many more factors that could be presented in a similar manner. This demonstrates that similar projects located in different provinces will have different returns on investment.

Accordingly, only projects within the same province can be truly comparable. However, in order to give a higher sample size for the common practice analysis the list has been extended from the province to the ECPG. At least within a regional grid access to resources such as coal will be similar based purely on geography and therefore the comparison regionally is still more robust than doing the comparison for the whole of China.

In the PDD 3 CDM projects have been included in the list. However at EB 38 new guidance was issued (paragraph 60) that states "*The Board clarified that in the context of conducting common practice analysis, project participants may exclude registered CDM project activities and project activities which have been published on the UNFCCC CDM website for global stakeholder consultation as part of the validation process."*

This guidance was not available at the time of submission of this project, but the project participant is able to make the necessary correction to the PDD as required. According to the guidance, two projects are registered (Ningguo Phase 2[43] and Zhejiang Hongshi[44]) and one is under validation (Changxing Xiaopu Zhongsheng[45]). As such they have now been removed from the common practice list as below.

A correction is made in the common practice as well since there was mistake in the projects listed in the common practice of the PDD. The project 5 Sanshi Zhejiang Changxing Cement Plant (2500+5000t/d) is the same as project 7 listed in the PDD. It means the same project appear twice in the common practice. Therefore project 5 is deleted in the common practice list below.

Also, Project 9 in PDD was removed as the project was built based on a clinker line with capacity of 1200t/d which is below the capacity of 2000t/d of clinker line. This cement line has been shut down already due to Government indistial policy therefore highlighting the risks associated with such investments. Indeed the project was shut down before the investment decision for the project activity had been taken. As such it is not thought appropriate to compare this failed small scale project. Furthermore it was developed as a demonstration of technology in 2003[46].

Excluding the projects mentioned above, by the end of 2005, there were totally 127 cement clinker lines using the dry technology with an output of more than 2000t/d in the ECPG. Of these 39 lines are in Anhui province, 50 lines in Zhejiang province, 30 lines in Jiangshu province, 7 lines in Fujian and 1 lines in Shanghai[47]. Among the 127 cement clinker lines; there are 7 WHR power generation projects on 8 clinker lines[48] that have not applied for the CDM. These projects are presented below.

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43 http://cdm.unfccc.int/Projects/DB/TUEV-SUED1169802677.31/view
44 http://cdm.unfccc.int/Projects/DB/DNV-CUK1183444695.42/view
45 http://cdm.unfccc.int/Projects/Validation/DB/OYGCGG7Y4GMNY5T3PQYF2H8XX9LN35/view.html
46 http://www.sinoma.cn/ReadNews.asp?NewsID=5619
47 Statistic figure of clinker lines with dried production method and output over 1000t/d in China, China Cement Association
48 Statistic figure of WHR projects in China, China Cement Association.

Other similar projects at similar sized cement plants and facilitating Circumstances in East China

No	Project Name	Public Source / reference	Facilitating circumstances
1	Anhui Ningguo Cement Plant (4000 t/d)	http://www.osti.gov/bridge/servlets/purl/926167-oYrbRc/926167.PDF	The project was Japanese NEDO granted Equipment in 1998
2	Zhejiang Huzhou Zhonglida Cement Plant (2500t/d)	http://www.ccement.com/news/2006/1-9/C1763443923.htm	Used domestic design and equipment. Funded by a foreign enterprise and thus eligible for tax reductions.
3	Sanshi Zhejiang Changxing Cement Plant (2500+5000t/d)	http://www.chinacements.com/news/2004/9-20/C1775652479.htm http://www.bm.cei.gov.cn/tabid/63/InfoID/81820/Default.aspx http://www.secidc.org.cn/newscontent.asp?id=786	Used domestic design and equipment. Sino-Hongkong joint-venture investment eligible for tax reductions.
4	Zhejiang Sanshi Cement Works (23.5MW)	http://www.zjskw.gov.cn/Index/Catalog327/928.aspx	Project undertaken by the State Owned Enterprise, Sanshi, as a domestic technology demonstration. Thus it was financed by Government.
5	Zhejiang Changxing Mei Shan Zong Sheng Cement Plant (5000t/d)	http://zjdaily.zjol.com.cn/html/2008-04/09/content_2179830.htm	Used domestic design and equipment. State Owned Enterprise and therefore funded as a demonstration by Government.
6	Zhejiang Tongxiang Shenhe Cement Plant (2500t/d)	http://www.jxet.gov.cn/gov/news/jjyx/200583154654.html	Used domestic design and equipment. Demonstration project of domestic technology. Supported by Governments and international organizations.
7	Zhejiang Longyou Qinglongshan Cement Plant (2500t/d)	http://218.72.253.122/news/shownews.asp?newsid=408	Used domestic design and equipment. Key demonstration project under the programme of circular economic development in Longshan.

There are a number of essential distinctions between the similar projects above and the Jiande project.

The first is that project 1 is entirely funded by the Japanese Government as a demonstration of Japanese Kawasaki technology in China. Thus, the project is possible without the CDM support.

The second distinction is that projects 2 and 3 are foreign investments which were built in 2004 and 2005 respectively and financed by foreign capital[49] that meant that the project owner can enjoy preferential income tax policies. Hence, they pay less income tax compared to domestic company. And as such enjoy preferential tax policy that provides reductions on annual income tax. The first 2 years are tax free and the following next 3 income tax is at 50% of the normal rate of 30%[50]. As such these projects had additional financial benefits in order to make them economically attractive.

The third distinction is that project 4 has been implemented by a State Owned Enterprise as a demonstration of domestic technology. Thus all finance came from the Government at very low risk. Aside from the fact that financing of this project is very low risk, but also the investment thresholds of SOEs are lower and therefore a lower benchmark would be applied and in this case it would likely be closer to the 12% Government approved benchmark for the sector.

The fourth distinction is that projects 5 to 7 are demonstration projects for domestic technology for low-temperature waste heat for power generation. These projects were part of the Government's Eighth Five-Year Plan to tackle key technology barriers and demonstrate domestic technology[51]. There is no doubt that these projects were given strong support by the state government to ensure implementation.

Project 5 is a part of key national demonstrate project of ten energy-saving programme projects over Eleventh Five-year Plan[52]. It is a subsidiary of China National Building Material Company Limited which is state owned company[53]. Thus, the project financing did not facing the any barriers.

As the first power generation project based on the utilization of waste heat from rotating kiln with new dried production method, project 6 had been greatly supported in either finance and policies by relevant national governments and international organizations such as National ministry of agriculture, global environmental fund, UNDP, Industrial development organization of United Nation from the project proposal approved to construction[54]. It also become a demonstrate project of emission reduction of green house gas for China rural enterprises

Project 7 is a key part of the programme of projects to encourage the circular economy development in Longshan County. This is also a key demonstration county of the Zhejiang Provincial circular economy development[55]. Therefore both Zhejiang province and Longshan County gave a great deal of political support to this project. This will also have been the case for the other two demonstration projects in Zhejiang.

The main difference between the two technologies is that the Kawasaki technology is more efficient and more expensive than domestic technology. The power generation of clinker per ton for the Japanese technology is 36-45kwh/t . This compares to 38-42 kwh/t for domestic

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[49] http://www.chinacements.com/news/2004/9-20/C1775652479.htm; http://www.ccement.com/news/2006/1-9/C1763443923.htm; http://www.zhonglida.com/html/zld-4jt-1.htm
[50] Income tax law for foreign investment enterprises, Command 45 of President of China
[51] http://www1.dcement.com/Html/yrfd/yrfd_tj/2007-3/18/20070318225708661 64.asp ;
[52] http://www.smezj.gov.cn/newzjsme/list.asp?id=5046
[53] http://zjdaily.zjol.com.cn/html/2008-04/09/content_2179830.htm
[54] http://www.jxet.gov.cn/gov/news/jjyx/200583154654.html
[55] http://218.72.253.122/news/shownews.asp?newsid=408

technology. The inner efficiency of turbine for the Japanese technology is 83%-90% and for the domestic technology it is 80-87%[56]. This can also been seen from the comparison of key parameters from Jiande conch with other WHR projects in China showed in the table above.

Furthermore, the levelised cost of domestic technology presented in Question 4 is higher than the proposed project due to the lower efficiency. However, the initial investment of the proposed project is higher than for domestic technology. The capital cost is of the Japanese technology is 9000 -12000RMB/KW compared to 5500-6500RMB/kW for domestic.[57] The Japanese technology therefore has a higher risk profile and has been more difficult to finance than domestic technology.

Given the lack of experience in the cement sector in waste heat recovery, companies tend to look at the lower cost initial investment and these technology applications have in the past been limited to demonstration projects as shown in the common practice analysis list.

(c) Why the PP has not Opted to use Domestic Technology

In 1998 Conch were awarded grant financing by the Japanese Government's Green Fund to demonstrate the Japanese Kawasaki waste heat recovery technology at their Ningguo plant (Ningguo Phase I). Subsequent to this demonstration project, Conch did not invest in any additional waste heat recovery plants since they were not core business and did not meet their financial objectives. Given that Conch already had some experience of the Kawasaki technology at one of their sites they only looked at roll out of this technology and not other less efficient technology options. Using domestic technology was therefore never an option that was considered seriously by Conch.

Additionally, domestic technology is less efficient and is not financial attractiveness in terms of Conch internal hurdle rate set up by the board. And at the same time not significantly less expensive. This is also shown in the answer to Questions 2 and 4. There is therefore no quantifiable economic benefit to using the domestic technology.

[56] http://www.chinacements.com/news/2007/4-11/C134253705.htm
[57] http://www.chinacements.com/news/2007/4-11/C134253705.htm

Response by TÜV SÜD

a) The project participant will rely on the investment analysis. The barrier analysis will be skipped in the revised PDD. For that reason an answer to this question is not needed anymore.

b) In the common practice analysis Waste Heat Recovery Projects constructed in the Cement Sector in East China have been assessed.
The investment environment for each province in China is different. This is due to variation of natural resources, the economic development level, the industrial structure, the infrastructure, development strategy and the policy framework.
The different labour costs and electricity prices have been presented by the “labor and electricity rates in 2006”.
As east china, is the region with the highest number of Cement plants and covers a large geographical area, the audit team is of the opinion, that the geographical boundary chosen by the project proponent is reasonable.

The assessment shows, that there are 11 Waste Heat Recovery project have been implemented in the Cement Industry.
One project (first phase of no.1 in PDD) was granted equipment by Japanese New Energy and Industrial Technology Development Organization. This has been checked and verified by the “Financing of Energy Efficiency Improvement for Cement Industry in China” issued by Globe Environment Institute (GEI).
Two projects are already registered CDM projects (second phase of project no.1 and no.3 in the PDD).
One project is applying CDM (no. 9 in the PDD). This has been checked and verified by the DOE by checking the UNFCCC webpage.
Two projects (no. 4 and no.5 of the PDD, project no. 2 and 3 in the table above) used foreign investment, which means the project owner enjoyed preferential tax policies and had to pay less income tax compared to domestic companies. This has been checked and verified by the China Cement news[58].
A remark has to be made here, that project no.5 in the PDD and project no.7 in the PDD are the same projects. Hence project no.7 in the PDD is not separately listed in the table above. Following the description above project no. 7 of the PDD has a different financing background.
One project (no 2 in PDD and no 4 in the table above) has been developed by a state owned enterprise. It was financed by the government and hence has a different investment background than the proposed project. This has been checked by the official government page. [59]
One project (no. 8 in the PDD and no. 5 in the table above) was part of the energy saving programme and got subsidies from the China National Building Material Company.[60]
One project was (no.10 in the PDD and no. 6 in the table above) supported by the national government and hence has been developed with a different investment background. [61]
One project was (no. 11 in the PDD and no. 7 in the table above) part of the programme of projects to encourage the circular economy development in Longshan County. Therefore the project received great political favour. [62]

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[58] http://www.chinacements.com/news/2004/9-20/C1775652479.htm;
59 http://www.zjskw.gov.cn/Index/Catalog327/928.aspx
[60] http://zjdaily.zjol.com.cn/html/2008-04/09/content_2179830.htm
[61] http://www.jxet.gov.cn/gov/news/jjyx/200583154654.html
[62] 62 http://218.72.253.122/news/shownews.asp?newsid=408

One project (no. 6 in the PDD) is much smaller than the proposed project. The project has been submitted for registration in March 2008, hence projects that have been implemented after that are not included into the analysis.

The DOE is of the opinion that the above mentioned explanation clearly shows the difference of the proposed project activity and the other Waste Heat Recovery Projects. Hence the project fulfils the criteria of step 4 of the additionality tool.

For that reason the project 1674 is different to those mentioned in the common practice analysis.

c) The DOE confirms that the project proponent already had experience with the applied Kawasaki equipment. They were awarded grant financing by the Japanese Government's Green Fund to demonstrate the Japanese Kawasaki waste heat recovery technology. The project proponent was satisfied with the equipment and hence chose to use it again.

Referring to issue 4

Response by Project Participant:

In accordance with the request for review questions the alternative baseline scenarios are as follows:

A. The proposed project activity undertaken without being registered as a CDM project activity;
B. Import of equivalent electricity from the ECPG;
C. Equivalent power supply from the existing or new captive plant on-site;
D. Equivalent power from captive plant and the grid ;
E. Equivalent power supplied by a WHR power plant where the domestic technology is applied
F. Equivalent power supplied by a WHR power plant where the domestic technology is applied and the shortfall is made up from purchase from the grid
G. Other uses of the waste heat;

As analysed in the PDD, scenarios C, D and G are not feasible baseline scenarios.

In order to answer Questions 3, 4 and 5 of the review questions, the assessment of a credible baseline scenario is conducted by an economic comparison of levelized costs for scenario A, B, E and F.

The project participant has prepared a levelised cost analysis for these 4 possible baseline scenarios. This has been done through a Net Present Value of the costs of the four scenarios and a subsequent evaluation of the levelised cost of each.

The results of this analysis is presented in the tables below:

Industrie Service

Power Generation

		Reference	0	1	2	3	4	5	6	7	8	9	10	11	12
Annual Power Generation (MWh)	A	FSR	-	53,317	59,241	59,241	59,241	59,241	59,241	59,241	59,241	59,241	59,241	59,241	59,241
Discount Factor	B	$= 1 / (1 + DR)^n$	1	0.84746	0.71818	0.60863	0.51579	0.43711	0.37043	0.31392	0.26604	0.22546	0.19106	0.16192	0.13722
Present Value of Annual Generation (MWh)	C	= A x B	-	45,184	42,546	36,056	30,556	25,895	21,945	18,597	15,760	13,356	11,319	9,592	8,129
Total Present Value of Annual Generation (MWh)	D	$= Sum (C_i)$	278,935												
Net Power Price (RMB/MWh)	**E**	**FSR**	398												

Scenario A. Jiande conch WHR Project

		Reference	0	1	2	3	4	5	6	7	8	9	10	11	12
capital cost	**F**	**=G+H**													
Equity	**G**	**FSR**	**41,626,400**												
Loan repayment and interest payment	**H**	**FSR**		**14,181,095**	**13,559,015**	**16,936,935**	**2,181,095**								
O&M Cost	**I**	**FSR**		**6,093,000**	**6,300,000**	**6,300,000**	**6,300,000**	**6,300,000**	**6,300,000**	**6,300,000**	**6,300,000**	**6,300,000**	**6,300,000**	**6,300,000**	**6,300,000**
production cost	*J*	*FSR*		*15,175,762*	*14,760,682*	*14,138,602*	*13,309,162*	*13,201,667*	*13,201,667*	*13,201,667*	*13,201,667*	*13,201,667*	*13,201,667*	*13,201,667*	*13,201,667*
Residue	*K*	*FSR*													*880,000*
Income Tax saved (@ 33%)	**L**	**=(J-K) x 0.33**		**5,008,001**	**4,871,025**	**4,665,739**	**4,392,023**	**4,356,550**	**4,356,550**	**4,356,550**	**4,356,550**	**4,356,550**	**4,356,550**	**4,356,550**	**4,066,150**
Total cost	**M**	**= G+H+I-L**	**41,626,400**	**15,266,094**	**14,987,990**	**18,571,197**	**4,089,072**	**1,943,450**	**1,943,450**	**1,943,450**	**1,943,450**	**1,943,450**	**1,943,450**	**1,943,450**	**2,233,850**
Discount Factor	N	$= 1 / (1 + DR)^n$	1	0.84746	0.71818	0.60863	0.51579	0.43711	0.37043	0.31392	0.26604	0.22546	0.19106	0.16192	0.13722
Present Value of Total annual cost	**O**	= MxN	41,626,400	12,937,404	10,764,075	11,302,987	2,109,102	849,501	719,912	610,088	517,035	438,170	371,316	314,683	306,529
Total Present Value of annual cost	**P**	**$= Sum (O_i)$**	**82,867,204**												
Levelised cost	**Q**	**P/D**	**297**												

Scenario B. Power Purchase

		Reference	0	1	2	3	4	5	6	7	8	9	10	11	12
equity in capital Cost	**F**	**FSR**													
O&M Cost	**G**	**FSR**		**21,223,752**	**23,581,946**	**23,581,946**	**23,581,946**	**23,581,946**	**23,581,946**	**23,581,946**	**23,581,946**	**23,581,946**	**23,581,946**	**23,581,946**	**23,581,946**
Income Tax saved (@ 33%)	**H**	**= G x 0.33**		**7,003,838**	**7,782,042**	**7,782,042**	**7,782,042**	**7,782,042**	**7,782,042**	**7,782,042**	**7,782,042**	**7,782,042**	**7,782,042**	**7,782,042**	**7,782,042**
Total Cost	**J**	**= F + G - H**		**14,219,914**	**15,799,904**	**15,799,904**	**15,799,904**	**15,799,904**	**15,799,904**	**15,799,904**	**15,799,904**	**15,799,904**	**15,799,904**	**15,799,904**	**15,799,904**
Discount Factor	K	$= 1 / (1 + DR)^n$	1	0.84746	0.71818	0.60863	0.51579	0.43711	0.37043	0.31392	0.26604	0.22546	0.19106	0.16192	0.13722
Present Value of Total Annual Cost	**L**	**= J x K**	**-**	**12,050,808**	**11,347,175**	**9,616,296**	**8,149,433**	**6,906,296**	**5,852,758**	**4,959,906**	**4,203,406**	**3,562,246**	**3,018,730**	**2,558,320**	**2,168,063**
Total Present Value of Annual cost	**M**	**$= Sum (M_i)$**	**74,393,438**												
Levelised cost		**Sum(Mi)/Sum(Li)**	**267**												

Scenario E. Domestic Technology to provide the equivalent power generation

	M	**installed capacity with equivalent net electricity supply(MW)**	**10.74**	**35,908,610**

		Reference	0	1	2	3	4	5	6	7	8	9	10	11	12
Capital Cost(million RMB)	**F**	**Average cost / MW taken from 4 domest WHR FSRs from the Sinoma Design Institute x M**	**71,435,547**												
where: equity			35,526,937												
Loan			34,138,852												
interest			1,769,758												
equity	**D**		**35,526,937**	**12,103,158**	**11,572,230**	**14,455,188**	**1,861,502**								
interest payment	***E***			***1,861,502***	***1,330,575***	***799,647***	***91,744***								
repayment principal	***F***			***10,241,655***	***10,241,655***	***13,655,541***	***1,769,758***								
Depreciation(million RMB)	G	As above		5,714,844	5,714,844	5,714,844	5,714,844	5,714,844	5,714,844	5,714,844	5,714,844	5,714,844	5,714,844	5,714,844	5,714,844
Amortization	H	As above													
O&M Cost(million RMB)	**J**	**As above**		**10,925,682**	**12,139,647**	**12,139,647**	**12,139,647**	**12,139,647**	**12,139,647**	**12,139,647**	**12,139,647**	**12,139,647**	**12,139,647**	**12,139,647**	**12,139,647**
Residue(million RMB)	K	As above													2,857,422
Income Tax saved (@ 33%)	**L**	**= (G+H+J-K) x 0.33**		**5,491,374**	**5,891,982**	**5,891,982**	**5,891,982**	**5,891,982**	**5,891,982**	**5,891,982**	**5,891,982**	**5,891,982**	**5,891,982**	**5,891,982**	**4,949,033**
Total Annual cost	**M**	**= D+J-L**	**35,526,937**	**17,537,467**	**17,819,895**	**20,702,853**	**8,109,167**	**6,247,665**	**6,247,665**	**6,247,665**	**6,247,665**	**6,247,665**	**6,247,665**	**6,247,665**	**7,190,614**
Discount Factor	N	$= 1 / (1 + DR)^n$	1	0.84746	0.71818	0.60863	0.51579	0.43711	0.37043	0.31392	0.26604	0.22546	0.19106	0.16192	0.13722
Present Value of Total Annual cost	**O**	**= MxN**	**35,526,937**	**14,862,301**	**12,797,893**	**12,600,378**	**4,182,627**	**2,730,917**	**2,314,323**	**1,961,267**	**1,662,129**	**1,408,599**	**1,193,679**	**1,011,622**	**986,696**
Total Present Value of Annual cost	**P**	**= Sum (Oi)**	**93,239,367**												
Levelised cosT	**Q**	**Sum(Oi)/Sum(Ci)**	**334**												

R	Installed capacity with equivalent net annual electrity supply	

Scenario F. Domestic Technology and purchase from the grid to provide the equivalent power generation

		Reference	0	1	2	3	4	5	6	7	8	9	10	11	12
Propotion WHR in Baseline	A	= 8.3 / "Scenario E" M	77%												
Propotion Grid in Baseline	B	= ("Scenario E" M - 8.3) / "Scenario E" M	23%												
Capital Cost(million RMB)	**C**	**= "Secnario E" x A**	**55,199,611**												
where: Equity	D	= "Secnario E" x A	27,452,343												
Loan	E	= "Secnario E" x A	26,379,742												
Interest	F	= "Secnario E" x A	1,367,526												
equity	**E**	**= "Secnario E" x A**	**27,452,343**	**9,352,341**	**8,942,083**	**11,169,800**	**1,438,418**	**-**	**-**						
interest payment	***F***	***= "Secnario E" x A***		***1,438,418***	***1,028,161***	***617,903***	***70,893***	**-**	**-**						
principal repayment	***G***	***= "Secnario E" x A***		***7,913,923***	***7,913,923***	***10,551,897***	***1,367,526***	**-**	**-**						
Depreciation(million RMB)	H	= "Secnario E" x A	-	4,415,969	4,415,969	4,415,969	4,415,969	4,415,969	4,415,969	4,415,969	4,415,969	4,415,969	4,415,969	4,415,969	4,415,969
Amortization	I	= "Secnario E" x A + "Secnario B" x B													
O&M Cost(million RMB)	**J**	**= "Secnario E" x A + "Secnario B" x B**	**-**	**13,266,237**	**14,740,263**	**14,740,263**	**14,740,263**	**14,740,263**	**14,740,263**	**14,740,263**	**14,740,263**	**14,740,263**	**14,740,263**	**14,740,263**	**14,740,263**
Residue(million RMB)	K	= "Secnario E" x A	-	-	-	-	-	-	-	-	-	-	-	-	2,207,984
Income Tax saved (@ 33%)	**L**	**= (H+I+J-K) x 0.33**		**5,835,128**	**6,321,557**	**6,321,557**	**6,321,557**	**6,321,557**	**6,321,557**	**6,321,557**	**6,321,557**	**6,321,557**	**6,321,557**	**6,321,557**	**5,592,922**
Total Annual cost	**M**	**= E +J--L**	**27,452,343**	**16,783,450**	**17,360,790**	**19,588,506**	**9,857,125**	**8,418,707**	**8,418,707**	**8,418,707**	**8,418,707**	**8,418,707**	**8,418,707**	**8,418,707**	**9,147,341**
Discount Factor	N	$= 1 / (1 + DR)^n$	1	0.84746	0.71818	0.60863	0.51579	0.43711	0.37043	0.31392	0.26604	0.22546	0.19106	0.16192	0.13722
Present Value of Total Annual Cost	**O**	**= M x N**	**27,452,343**	**14,223,303**	**12,468,172**	**11,922,153**	**5,084,206**	**3,679,901**	**3,118,541**	**2,642,800**	**2,239,713**	**1,898,082**	**1,608,478**	**1,363,157**	**1,255,198**
Total Present Value of Annual Cost	**P**	**= Sum (Oi)**	**88,956,047**												
Levelized cost	**Q**	**Sum(Oi)/Sum(Ci)**	**319**												

According to ACM0004 and the Additionality Tool, the equivalent output and quality of electricity must be supplied by the alternative scenarios. As such, the NPV of the costs for the four scenarios are compared for the equivalent amount of power generation. Since domestic technology is unable to generate the same amount of power, the third scenario represents 10.74

MW[63] instead of 8.3 MW and the fourth scenario (scenario F) includes partial purchase of electricity from the grid to make up the difference.

Also when defining these scenarios different tax situations have been considered. This is due to the fact that scenario of the project activity (scenario A) without CDM includes a capital investment and the scenario of purchasing electricity from the grid (scenario B) does not. For scenarios A, E and F there is a capital allowance for the depreciation and amortization of the capital cost (excluding residue). For scenarios A and B, E and F income tax will be due. Income tax is due on net income and this will be different in each case as there is a tax benefit in having higher annual costs i.e. less tax will be paid. In other words net annual income will be less when there are higher annual costs and therefore income tax will also be less. Conversely, when net annual income is higher then so are the taxes.

The calculation of levelised cost of scenario E is based on average parameters from the FSRs of four WHR projects that use domestic technology[64]. The parameters used are as follows[65]:

- Average operation hours under full load per year (5791 hours/year),
- Unit capital cost per MW (6.651 million RMB/KWh),
- Unit operation cost (0.1893 RMB/KWh),
- Self-consumption rate (7.6%)

These four projects are the full set of feasibility studies undertaken by the Sinoma Design Institute, which is the same Institute that has undertaken the feasibility reports for Conch[66]. The data from these projects has been used for the comparison and this data has also been compared with the data used in projects available from the UNFCCC web site (see question 2 above). This shows that the data used in this analysis is also consistent with the parameters used by other CDM projects.

When using the levelised cost analysis the scenario with the least cost is determined as the baseline. In this case the lowest levelised cost of power generation is for scenario B (purchase from the grid). Scenario B has a levelised cost of 267 RMB/MWh. This compares to 297 RMB/MWh for scenario A (the project), 334 RMB/MWh for scenario E (domestic technology) and 319 RMB/MWh for scenario F (domestic technology and grid purchase).

According to this, the baseline is purchase of power from the grid. This assessment further demonstrates the additionality of the project and is compliant with Sub-step 2b: Option II. Apply investment comparison analysis. This also further substantiates Question 1 above and demonstrates that the project is additional based on the results of this investment analysis.

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[63] Installed capacity required = 132,060/5971hours x (1-7.6%) = 24 MW
[64] Attached relevant pages of FSR for these four projects
[65] Attached Key Financial data of projects with domestic technology
[66] These are not related to the projects in the common practice list as information on the projects is not publically available and the feasibility study reports were developed in the past year, so are likely to be at an early stage

Response by TÜV SÜD:

The economical analysis of Jiande Conch Cement Company limited to implement a CCPP project, was based on benchmark analysis during the investment decision, which revealed that calculated IRR was below the benchmark as validated by TÜV SÜD and confirmed in response to issue 1 above.
The above described "levelised costs analysis" was conducted since the barrier analysis has been withdrawn in the PDD by the project participant and was required to fulfil the methodological requirement as stated in the Request for Review. This analysis has been validated and is found to be appropriate and shows that scenario A (generating electricity at the Jiande Cement Plant) has higher levelised cost of 297 RMB/MWh than scenario B (purchasing electricity from the grid) 267 RMB/MWh. In this scenario the project owner would continue purchase from grid since this option is more economically feasible.

Input values to this analysis are similar to the analysis presented earlier. These input values were already validated during validation process and have been further confirmed in response to issue 2 above.
The method of comparison is appropriate in our opinion since it clearly presents the price to get a unit of electricity (kWh) in both scenarios.
The discount rate used for project scenario is same as benchmark and is considered to be very appropriate.
Additionally the scenario to continue purchase from grid does not require high initial investment and no further risks, where as the development of the project includes both. Hence the baseline scenario should be purchasing electricity from the grid.
In scenario E the project proponent calculates the levelised cost of generation from domestic technology to provide equivalent power. This analysis has been validated and is found to be appropriate and input values have been validated. The operational hours, O&M costs and the investment costs for domestic technology has been validated from FSRs provided to TÜV SÜD for four WHR projects using domestic technology.
In scenario F the project proponent calculates the levelised cost of generation from domestic technology and importation from grid to provide equivalent power. This analysis has been validated and is found to be appropriate and input values have been validated.
This analysis shows that import of electricity from the grid is the most economical scenario from above four scenarios. The scenario of application of domestic technology is the more economically unattractive compared to the project and hence is not a likely scenario without incentives.

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Referring to issue 5

Response by Project Participant:

As shown above the project participant has included an additional scenario to be considered for the baseline. This is the utilisation of waste heat with domestic technology. This was not considered in the PDD as this was not an option for Conch given that they already had experience of the Japanese technology through the grant financed project at Ningguo in 1998. However for completeness it has been included above and it has been demonstrated that the venting of waste heat and the importation of electricity remains the baseline option.

This levelised cost analysis shows that domestic technology is the most expensive option for power supply and as such is not the baseline. The analysis also shows that the venting of waste heat and importation of electricity remains the least cost option for Conch and is therefore a credible baseline.

With respect to the prevailing practice the PP response to Question 3 explains the essential distinctions between the similar projects that have occurred in order to show that these projects (both international and domestic technology) enjoyed different circumstances and benefits that made their implementation possible without CDM support.

As the analysis in question 3, by the end of 2005, there were totally 127 cement clinker lines using the dry technology with an output of more than 2000t/d in the ECPG. Of these 39 lines are in Anhui province, 50 lines in Zhejiang province, 30 lines in Jiangshu province, 7 lines in Fujian and 1 lines in Shanghai[67]. Among the 127 cement clinker lines; there are 10 WHR power generation projects (including applying for CDM projects) built on 13 clinker lines[68] , only 10.2% of clinker lines utilize implemented WHR projects. This also demonstrates that the venting of waste heat is a common practice in East China.

[67] Statistic figure of clinker lines with dried production method and output over 1000t/d in China, China Cement Association
[68] Statistic figure of WRR projects in China, China Cement Association.

Response by TÜV SÜD:

Response to issue 3 and 4 above clearly demonstrate that domestic technology for waste heat recovery in cement plants in the region is not the baseline scenario. The domestic technology has been proved to be economically more unattractive compared to import from grid and implementation of project activity, which further substantiates the common practice analysis where it has been proved that all the projects using domestic technology that have been implemented only through grants/donations/subsidies etc.

Hence we are of the opinion that without incentives from CDM and other grants/subsidies/incentives, the total venting of waste heat and importation of electricity is a credible baseline in cement clinker production facilities in the region.

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