

MINUTES OF THE BOARD MEETING

25 FEBRUARY 2015, BRUSSELS, BELGIUM

Present:

Bernard Quoix, President (BQ)	TOTAL
Catherine Goy, Vice President (CG)	E.ON Technologies
Giovanni Cerri (GC)	University Roma TRE
Gary Lock (GL)	Frazer Nash Consultancy
Tomas Volks (TV)	MTU
Andy Williams (AW)	EthosEnergy
Herwart Hönen, Treasurer (HH)	RWTH Aachen University
Robert Rijdsdijk (RR)	Shell
Christer Björkqvist (CB)	ETN
Dominique Cornut (DC)	ETN

Apologies

Pericles Pilidis (PP)	Cranfield University
Chris Lappee (CL)	Vattenfall

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Annex 1: Review of action lists from previous Board meetings

1. Welcome and opening of the Board meeting

B. Quoix opened the meeting and welcomed the Board members. P. Pilidis and C. Lappee sent their apologies for not being able to join the Board meeting.

Renewed nomination of A. Williams on the ETN Board

C. Björkqvist informed the Board that his previously circulated request regarding whether A. Williams could continue as a Member of the Board in his new position as an employee of Chromalloy, had been approved by the Board unanimously.

2. Review and approval of the MoM, 4 December 2014

The Board unanimously approved the December Board meeting minutes.

3. Review and report of actions list from the MoM, 4 December 2014

The status of all actions is updated in the Annex. The following comments were added by the Board:

RWE Power: membership opportunities

C. Goy reported that she spoke to a representative of RWE Power about membership. She will meet him again in the coming months and will follow-up with him. She also stated that E.ON is selling its assets and that some of the buying companies might be interested in joining ETN: Macquarie Group (Australian company) is buying E.ON's Spanish CCGT assets and Energetický a Průmyslový Holding (EPH) (Czech energy company) is buying E.ON's Italian CCGT assets.

Rolls Wood Group: membership opportunities

C. Björkqvist reported that no action has been taken due to the joint venture between Rolls Wood Group and Siemens. B. Quoix stated that we should wait to see how things are going to be managed by the joint venture before approaching them. A. Williams was asked to send the contact details of RWG representatives to the ETN office.

Action: AW to send the contact details of RWG representatives to the ETN office.

Results of ETD's study on *Consulting on Guidelines for Preservation of CCGT*

C. Goy reported that she contacted Michael Denève (Laborelec/GDF Suez) which confirmed that there was a study made by ETD on *Consulting on Guidelines for Preservation of CCGT*. However it remains unclear if Laborelec received many results from this study and how much of the results they would be willing to circulate on the ETN platform. C. Goy would follow-up with Michael Denève. C. Björkqvist proposed that a short presentation (1-2 slides) could be presented at the AGM by C. Goy and Michael Denève.

Action: C. Goy to follow-up with Michael Denève on the *Consulting on Guidelines for Preservation of CCGT on the opportunity to present 1-2 slides at the AGM*.

Potential member: Petrobras

C. Björkqvist stated that he contacted Petrobras recently and would forward this email to T. Volks and B. Quoix in order for them to coordinate on the best approach to get Petrobras as a member.

Action: CB to forward the email he has sent to Petrobras to both TV and BQ.

Potential member: Sino Australia Oil & Gas

It has previously been proposed to approach Sino Australia Oil & Gas as a major oil and gas company but no suitable representative within the company has been identified. B. Quoix offered to find the right person to contact.

Action: BQ to find the right representative to contact at Sino Australia Oil & Gas.

AGM 2015 sponsorship

C. Björkqvist reported that Solar Turbine has Taurus 60 gas turbines in the Guinness factory and has been invited to sponsor the dinner and organise a site visit. B. Quoix and C. Björkqvist would identify and approach other sponsor candidates if they would receive a negative answer.

Action: If Solar declines ETN's invitation to sponsor the AGM, CB and BQ to identify and approach other sponsor candidates.

Affiliate members: other markets

R. Rijsdijk proposed to target "information hungry" user companies in Africa as they are very interested in having contacts/knowledge in Europe. ETN should make a list of potential companies in Africa and the Middle East and North Africa (MENA) region.

Action: ETN should make a list of potential companies in Africa and the Middle East and North Africa (MENA) region.

4. ETN Activities Update

The Board took note of the Activities Update, which was circulated ahead of the meeting by the ETN office. The following comments were added by the Board:

SOLFLEX and FLEXGEN proposals

C. Björkqvist reported that the SOLFLEX and FLEXGEN projects were not evaluated positively by the European Commission (EC) and that Horizon 2020 is short of money. Consequently, evaluators are being asked to be extremely strict. He also stated that some of the comments received on these proposals were not always correct and showed that some evaluators have not understood the proposals. The Board proposed that the Project Board should review the provided comments of the EC, and based on their conclusions, ETN should write a letter to the EC in order to challenge the evaluation of the proposals.

Action: CB together with the Project Board to go through the evaluation report and write a letter to the EC. The Board agreed that H. Hönen should supervise this activity.

Report of C. Björkqvist's meetings in China

C. Björkqvist reported that he and Dick van der Vecht (GDF Suez) had attended several meetings which were organised with the help of Professor Jiang, Professor at Tsinghua University (Beijing) and Director of the National Research Centre (NRC) for Gas Turbine and IGCC Technology in China. They had a meeting with nine utility companies (28 participants in total), met with TPRI "Users Research Institute" and also visited the Beijing Taiyanggong Gas-Fired Thermal Power Corporation, which has been built for the Olympic Games.

The NRC provided an overview of operation and maintenance status of gas turbine stations in China. They reported that quite a substantial increase in gas turbine operations is expected within the coming years both as a result of a shift from coal to natural gas in the major cities due to pollution and to the increasing amount of renewable power generation where the flexibility of gas turbines will play an important role. The meeting then focused on the Chinese utilities' main concerns when it comes to operation and maintenance of gas turbines, with a focus on DLN, combustion and damages. The benefits for the utilities to be actively involved within ETN was then highlighted and discussed.

After the meetings, it was recommended by the NRC to cooperate with ETN and to become an Affiliate member. Each of the individual utilities were positive to an engagement with ETN and would make an internal recommendation for membership. After the meetings, C. Björkqvist and Dick van der Vecht drafted a Memorandum of Understanding (MoU), which was sent to Professor Jiang. As all utilities are connected to the Government (MOST) a MoU with the Government-funded organisation NRC could facilitate the internal approval from the individual utilities. C. Björkqvist reported that the NRC has recently signed the MoU.

The Board welcomed the MoU with NRC and as soon as Chinese users start to sign up for membership, the Board agreed to start exchanging information and experiences, to set-up workshops and courses, to explore joint cooperation projects and to offer to organise visits in Europe to interested ETN members facilities.

Action: CB to follow up on membership and propose topics for workshops to Professor Jiang.

Report of C. Björkqvist's meetings in United Arab Emirates

C. Björkqvist reported that he met with high level representatives of the following companies in Dubai and Abu Dhabi: ADGAS, GASCO, ADMA OPCO and Dubai Electricity and Water Authority (DEWA). He also visited the DEWA Jebel Ali Power station (UAE's largest power and desalination plant of 9.6 GW) and met with local representatives from Ethos Energy.

The meetings, which were all on Vice-President Level, were successful from the perspective that all participants were very interested in ETN and our activities. However, all reported that they needed approval from their Executive VP and would write a recommendation report. Thus, so far no one has yet signed up for membership. The Board suggested ETN to also target companies such as Qatar Gas, Saudi Electric, Qatar Petroleum, and Petroleum Development Oman.

5. ETN Finances 2015

H. Hönen explained the budgets for 2014 and 2015. The result in 2014 was about 69 000 euro due to provision from the H₂-IGCC project (60 000 euro). The year 2015 will end with a surplus of approximately 25 000 euro. To reach this result a major portion of the 2014 result was used as provisions. The budget for 2016 is uneven due to the lack of EU projects and is also based on no new members.

The Board also decided not to increase the membership fee for 2015 as it is a time where companies are forced to reduce cost.

6. Strengthening the user community

a) Report on the user e-questionnaire preliminary outcomes

C. Björkqvist reported that only four users completed the questionnaire out of 22, but that five more users have promised to complete the questionnaire by March.

b) Cooperation with GTUsers.com – Way Forward

C. Björkqvist reported that a joint press release has been published on both ETN's website and GTUsers.com's website. A dedicated GTUsers.com section would also be published in ETN's Quarterly Newsletter. He also mentioned that GTUsers.com has a questionnaire distributed to users before attending user conferences and the next step would be to see how we could merge ETN's and GTUsers.com's questionnaires to avoid duplications. The next user conference organised by GTUsers.com would take place 14-16 April in Valencia and would focus on the 6FA engine. C. Björkqvist stated that Yrjö Komokallio would ask his Steering Committees for the individual engines to provide feedback to ETN's Technical Committees after each user conference. Yrjö also tries to get approval for ETN to have access to the member's area of GTUsers.com, reported C. Björkqvist.

The Board proposed to present a summary of ETN/GTUsers.com's partnership at the upcoming AGM in April.

The Board thoroughly discussed how to increase the flow of information from the user companies. It was agreed that ETN should approach independent organisers of established European user conferences with the objective to initiate cooperation with them. Based on the input from the user community and the ETN questionnaire, the following gas turbine models have been identified as the ones with the highest amount of reported issues: SGT 400, LM 2500+ G4 , RB211 24G, GT (GT 61 and 62) and SGT 600.

The Board also suggested to create a one-pager "flow chart" which would clearly show ETN's strategy and that could be presented to the General Assembly in Dublin.

Additionally, R. Rijsdijk stated that the benefits of ETN must be crystal clear for Affiliate members and that we need to develop a strategy to attract and retain members.

Action: CB to draft a one-pager "flow chart" which would clearly show ETN's strategy and draft a strategy to attract and retain Affiliate members.

Action: The Board to review and comment CB's proposal on the flow chart and the strategy to attract and retain Affiliate members.

7. Strategy related to the cost cutting

The Board agreed that ETN would need to explore how it could help users to cut costs and increase profitability through cooperation. The following suggested topics by C. Björkqvist were discussed:

- technical developments that can increase reliability and availability,
- technical developments that can increase lifetime and reduce price of parts,
- exchanging best practises & standard developments to ensure the most reliable, safe and cost-efficient solutions,
- exploring spare parts pooling,
- exploring cooperation that can reduce manufacturing cost like sharing of equipment, demonstration facilities etc.,
- sharing information, highlighting major issues and speaking with one voice with the OEM's and suppliers,
- commonly pushing for fulfilment of the expected quality requirements,
- ensuring a high competitiveness among suppliers and service providers,
- benchmarking.

The board agreed that all of the above topics should be explored apart from spare-parts pooling for the oil & gas sector as this was a too difficult and complex issue due to country specific operations and joint partnerships, according to B. Quoix.

8. Upcoming AGM and Workshop: 10th Anniversary of ETN

C. Björkqvist proposed to the Board to have a panel discussion on both the revised strategy and on how to maximise cooperation opportunities to face the current market environment, which would be presented by oil & gas and utility companies as well as some Board members. The Board welcomed this idea and agreed that R. Rijdsdijk, C. Goy, B. Quoix and H. Hönen could be on the panel. Additional members of the Board could also be included.

9. Update: ETN Internal Rules

C. Björkqvist explained that the complementary document to the Articles of Association (AoA), namely ETN's Internal Rules, would need to be updated and presented to the AGM for approval. The background to have two documents is that the internal rules can be changed without a Royal Decree (Belgium Government's approval). However, the Board was concerned that having two documents would lead to confusion and recommended that in any case duplication of text between the two documents must be avoided.

Action: ETN office to go through ETN's Internal Rules and to remove all sections identical to the Articles of Association.

Action: The Board to go through the Internal Rules once the ETN office have circulated a revised version of the document.

10. Upcoming ETN meetings

Name of Meeting	Date	Location
Exhaust Systems Project meeting	23 March 2015	TBD
Board meeting (half day before the AGM)	21 April 2015 8:00 – 11:45	Dublin
AGM and Workshop	21-22 April 2015	Dublin
OMSoP Consortium meeting	27-28 April 2015	Rome
Board Meeting	1 July 2015	Brussels
ETN October Workshop	21-22 October 2015	TBC
Project Board and Chairpersons (TCs) Meeting	26-27 November 2015	Brussels

On the availability to upcoming Board meetings, A. Williams stated that he might not be able to make it for the Board meeting on 21 April due to his new position at Chromalloy as of 1 April. G. Lock said that he would not be able to attend the Board meeting on 1 July due to other commitments.

11. Closing of the Board meeting

B. Quoix closed the Board meeting.

ACTION LIST

No	New Actions	Resp.	Date
1	AW to send the contact details of RWG representatives to the ETN office.	AW	April 2015
2	C. Goy to follow-up with Michael Denève on the <i>Consulting on Guidelines for Preservation of CCGT on the opportunity to present 1-2 slides at the AGM.</i>	CG	30 March 2015
3	CB to forward the contact details of the contact persons within Petrobras to both TV and BQ.	CB	April 2015
4	BQ to find the right representative to contact at Sino Australia Oil & Gas.	BQ	April 2015
5	If Solar declines ETN's invitation to sponsor the AGM, CB and BQ to identify and approach other sponsor candidates.	CB, BQ	March 2015
6	ETN to make a list of potential companies in Africa and the Middle East and North Africa (MENA) region.	ETN office	April 2015
7	CB together with the Project Board to go through the evaluation report and write a letter to the EC. The Board agreed that H. Hönen should supervise this activity.	CB, HH	April 2015
8	CB to follow up with membership of Chinese utilities and propose topics for workshops to Professor Jiang.	CB	April 2015
9	CB to draft a one-pager "flow chart" which would clearly show ETN's strategy and draft a strategy to attract and retain Affiliate Members.	CB	March 2015
10	The Board to review and comment CB's proposal on the flow chart and the strategy to attract and retain Affiliate members.	Board	April 2015
11	ETN office to go through ETN's Internal Rules and to remove all sections identical to the Articles of Association.	ETN office	March 2015
12	The Board to go through the Internal Rules once the ETN office circulated a revised document.	Board	3 April 2015

ANNEX 1

STATUS OF ACTION LIST (from MoM December Board meeting, Brussels, Belgium)

No	New Actions	Outcome/Next action	Resp.
1	The Board to fill in and add missing information on the list of users provided by the ETN office (i.e. user companies/contact persons not included in the list).	Done	Board
2	CG to discuss membership opportunities with RWE npower.	On-going	CG
3	BQ to contact Mitsubishi to discuss membership opportunities	On-going BQ is waiting for a response from Mitsubishi and believes that they will become a member soon.	BQ
4	CB to contact Rolls-Royce Wood Group to discuss membership opportunities.	Postponed	CB
5	TV to contact MRO within the GKN Aerospace group to discuss membership opportunities.	Postponed to April	TV
6	ETN office to circulate the MCPD's executive summary, prepared by Roger Brandwood, ETN IED Committee Chair/E.ON Technologies, on the ETN platform.	Done	ETN office
7	ETN office to implement the new payment rule for the next AGM (not possible to attend ETN events if no proof of payment).	Done	ETN office
8	CB to follow-up with Mechthild Wörsdörfer, EC in order to get her feedback from the IGTC and to propose a joint Dinner Debate in 2016.	Postponed CB followed-up with her and she thought the IGTC was a good meeting. CB will follow-up with her later as now is too early.	CB
9	CG to follow-up with Michael Denève from Laborelec on the outcome of the study made by ETD Consulting on <i>Guidelines for preservation of CCGT</i> .	On-going	CG
10	TV and BQ to coordinate on the best approach to contact Petrobras, in order for them to join ETN.	On-going	TV, BQ
11	TV to contact Russian user companies to discuss membership opportunities.	Postponed	TV
12	ETN office to prepare a template email for TV as well as the rest of the Board in order to invite user companies to join ETN.	Done	ETN office
13	CB to send the user questionnaire to UAE companies, Petrobras and companies in China after his planned visit in January 2015.	Done	CB
14	CB to follow-up with Yrjö Komokallio to agree on a plan and structure to initiate this cooperation between ETN and GTUsers.	Done	CB
15	CB to circulate the proposed plan and a joint statement (press release) on ETN's partnership with GTUsers, to be approved by the Board before its publication.	Done	CB

16	PP to contact Mahmoud Sabban which is a current GTUI Board of Director and was a student at Cranfield.	On-going	PP
17	BQ to provide the contact details of Dolphin Energy to the ETN office.	Done	BQ
18	BQ to contact Sino Australia Oil & Gas, which has some assets in China to discuss membership opportunities.	On-going	BQ
19	CB to contact Maria Martin from EPRI to ask for a list of user companies in South America.	Postponed to April	CB
20	HH and CB to bring-up the issues of late payments at the AGM and propose ways to address this.	Done	HH, CB
21	HH to adapt the budget if any of the EC proposals would be accepted.	Done No proposal accepted	HH
22	CB to attend the next user groups meetings organised by Yrjö Komokallio.	On-going. The next user conference will take place in Florence in April.	CB
23	BQ/CB to contact Mitsubishi and Siemens to sponsor the AGM in Dublin or alternatively Solar Turbines.	On-going.	BQ, CB
24	CB to contact Niall O'Boyle ESBI to ask if they could host the Board meeting and to ask for suggestions for site visits.	Done	CB

PENDING ACTION LIST (from MoM February 2014 Board meeting)

No	Actions	Outcome / Next action	Resp.
1	CB to spread ETN reserves into different banks.	On-going	CB
2	UK to follow up with GKN for membership in a meeting set to take place at the end of December 2013	Deleted	
3	UK to meet with Bo Pedersen of Maersk to discuss ETN membership.	On-going. TV will follow-up with Uwe Kaltwasser on the status of his action and will report to the next Board meeting.	
4	ETN to circulate the list of potential users (oil & gas and utilities) both in the European Economic Area or Switzerland and outside in order to invite them as an ETN member.	Done	CB