

MINUTES OF THE BOARD MEETING

BRUSSELS, BELGIUM, 9-10 DECEMBER 2013

Present:

Bernard Quoix, President (BQ)	TOTAL
Catherine Goy, Vice President (CG)	E.ON UK
Herwart Hönen, Treasurer (HH)	RWTH Aachen
Andy Williams (AW)	Wood Group
Giovanni Cerri (GC)	University Roma TRE
Chris Lappee (CL)	Vattenfall
Uwe Kaltwasser (UK)	MTU
Gary Lock (GL)	Frazer Nash Consultancy
Robert Rijdsijk (RR)	Shell
Christer Björkqvist (CB)	ETN
André Mom (AM)	President Emeritus
Dominique Cornut (DC)	ETN
Karen Geris (KG)	ETN

Apologies:

Pericles Pilidis (PP)	Cranfield University
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Content:

1. Welcome
2. Review and approval of the MoM London, UK, October 2013
3. Review and report of Action List from the MoM London, UK, October 2013
4. Review of ETN activities update
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6. ETN finances
7. Project Board R&D Recommendation Report
8. Research and technological development calls under Horizon 2020
9. ETN strategy – development of a 5-10-year plan
10. Discussion on the proposed changes on ETN's articles of association and internal rules
11. Strategy implementation process and roadmap
12. International Gas Turbine Conference (IGTC) 2014
13. High Level User Meeting (HLUM) and dinner debate
14. Upcoming Board meetings and events
15. Closing of the Board meeting

Annex: Review of Action List from previous Board meetings.

1. Welcome

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

2. Review and approval of the MoM London, UK, October 2013

The Board unanimously approved the October 2013 Board meeting minutes.

3. Review and report of Action List from the MoM London, UK, October 2013

See Annex.

4. Review of ETN activities update

The Board took note of the update on ETN activities circulated ahead of the meeting by the ETN office, and discussed the following points further.

Air Filtration Workshop:

C. Goy highlighted the importance of having a two-way discussion during the Air Filtration Workshop. She proposed to make the agenda available to the user community for comments before its circulation to the participants. The Board also discussed the possibility for the utilities and oil and gas companies to make a presentation during the Workshop that would highlight recurring issues. C. Björkqvist mentioned that Laborelec had expressed its interest to make a presentation. C. Goy proposed to coordinate a joint presentation with them. B. Quoix suggested giving BP the opportunity to present their issues at the Workshop in order to convince them to become an ETN member.

Action: CB to discuss the possibility for the user community to comment the agenda with the filtration companies.

Action: CG to coordinate a joint presentation with Laborelec.

Action: BQ to invite BP to the Workshop and to follow-up on the membership discussion.

Outstanding payments:

C. Björkqvist reported that there are still some outstanding payments but the majority are in the process of being paid. He mentioned that there is an on-going dispute with Wamar who currently has not paid their 2014 membership fee due to an internal confusion within Wamar on which office Wamar Engineering or Wamar Industries Europe should make the payment. It was decided that it should be Wamar Industries Europe, addressed to Mr. Jorge Montes del Pino, President and CEO. C. Björkqvist explained that the 2012 invoice was then paid in 2013 by Wamar France, but they have refused to pay for 2013. C. Björkqvist stated that the matter has been handed over to the debt collector. B. Quoix proposed to contact the founder of Wamar, Mr. Nabil Barakat to solve the issue if they are not successful in collecting the outstanding payment for 2013.

Action: CB to follow-up with the debt collector and inform BQ if the company can't collect the fee so he could follow-up on this with Nabil Barakat.

IGTC-2014:

C. Goy mentioned it would be valuable to know how many people clicked on the IGTC proceedings 2008 and 2010 available on the ETN website.

Action: CB to verify if we can implement a function on our website that enables us to see how many people visited the pages of IGTC 2008 and 2010.

5. Joint report on meetings in China

C. Björkqvist gave the Board an overview of the Chinese market and the meetings he attended in China.

Chinese market:

C. Björkqvist reported that China has announced a “Low carbon-roadmap” in order to tackle air, water, and soil pollution, which will be a top priority for the government in the next five years. They have an intention to cut emissions from today's level by 30% in Beijing and by 25% overall in China, both within the next 5 years. Currently China has around 70% fossil fuelled generation (66% coal, 3% gas, 1% oil) and the bigger cities are suffering from heavy pollution. The Ministry of Science and Technology (MOST) are currently identifying suitable CO₂ emission schemes along with compensation schemes to incentivise a change from direct coal fired generation to natural gas fired generation (with CHP when possible). China is also likely to start carbon emissions trading in Beijing, Shanghai and Guangdong province by the end of this year. A national-level emission trading platform may be set-up by 2015 based on the performance of these local markets.

C. Björkqvist informed the Board that the Chinese government's objective is to install efficient IGCC plants (capture ready for future CCS), more renewable generation (wind, PV, CSP) and low carbon hybridisation generation solutions for distributed generation as well as an increase in nuclear generation. Currently 17 nuclear plants generate less than 2% of the electricity but China has 32 plants under construction which is expected to increase nuclear generation to 6% of its total generation mix by 2020. Hydro is the second biggest electricity generation source with 19% of the mix.

World GT China Summit, Shanghai:

C. Björkqvist informed the Board that he gave a presentation on “*Gas Turbines in a Low-Carbon Economy - European opportunities and Challenges*” and also moderated a panel discussion on the role of gas turbines in China's future energy mix. He stated that the meeting provided an opportunity to increase ETN's visibility and to promote the upcoming International Gas Turbine Conference.

Gas turbine power generation special committee, Shenzhen:

C. Björkqvist reported that he met with the Chinese *Gas Turbine Power Generation Special Committee (AGTPG)* in order to learn more about their association and explore potential cooperation opportunities. As AGTPG is a user driven committee, its objectives are very similar to ETN's. However, their activities seem to be limited to two yearly gatherings where they discuss the needs of the users.

EU-China Delegation to Xi'an - Networking Cooperation Workshop on CSP:

C. Björkqvist reported that the Ministry of Science and Technology (MOST) and the European Commission (DG Research and Innovation) organised a networking cooperation workshop on CSP. He informed the Board that potential cooperation between China and EU were explored with regards to hybridisation projects (for example GT with CSP). This meeting provided ETN with high level contacts (English speaking) within MOST. C. Björkqvist mentioned that a Director has already agreed to be a keynote speaker at the upcoming IGTC-2014. He added that valuable connections with Chinese experts on potential areas of technology development were made, which could be valuable to the OMSoP project. In the first phase, China could help with the market analysis and in the second phase, with the component development.

6. ETN Finances

H. Hönen presented the current state of ETN finances and explained that ETN is doing better than expected, due to the reception of more membership income as well as lower spending. The final numbers for 2013 and the forecast for 2014-2015 will be presented at the next Board meeting (teleconference) on 13 February 2014.

Although the financial outlook of ETN is positive, the H₂-IGCC project will come to an end next year which will reduce the income. It was acknowledged by the Board that ETN should not be too dependent on EU project income and we therefore need to bring in more membership income by bringing in more users.

Moreover, due to the fact that Banks can only guarantee up to 100 000 euro on saving account, the Board proposed to spread ETN reserves to different banks.

Action: CB and HH to present the Board a proposal to spread ETN reserves into different banks.

7. Project Board R&D Recommendation Report

The R&D Recommendation Report was welcomed positively by the Board. However, C. Lappee made a statement that he believed some research areas listed are too unrealistic and should not be listed as priority R&D fields. C. Björkqvist promised to discuss his comments with the Project Board at the upcoming meeting in January 2014.

Action: CB to discuss CL's comment with the Project Board at the upcoming meeting in January 2014.

8. Research and Technological Development Calls under Horizon 2020

With regards to Horizon 2020, C. Björkqvist reported that the funding for energy project call recommendations goes from around 5 to 15 million euro. He informed the Board that the European Commission (EC) would rather fund one bigger project than several small projects. Also, if a project proposal is tackling the subject with a higher cost than the call recommendation and the consortium can justify the costs, the EC could still decide to fund the project.

C. Björkqvist presented the final work programme of Horizon 2020 and the calls of potential interest for ETN. C. Björkqvist suggested to update the former version of the HYCOSOL project and to submit it under the call LCE3 "*Demonstration of renewable electricity and*

heating/cooling technologies”, where CSP (“Improving the flexibility and predictability of CSP generation”) is identified as a challenge to be addressed. The deadline to submit a proposal is 10 September 2014.

With regards to LCE17 “Highly flexible and efficient fossil fuel power plants”, C. Björkqvist informed the Board that the deadline to submit a proposal is 3 September 2014. H. Hönen proposed to start to construct the consortium as soon as possible. C. Goy proposed to initiate the discussion with OEMs. C. Björkqvist stated that ETN is currently organising a Project Board meeting, set to take place on 29 January 2014, to discuss the proposed calls and way forward.

9. ETN Strategy – development of a 5-10-year plan

C. Björkqvist briefly presented the conclusions of the last major strategy discussion, which took place in June 2011 in Paris and compared them with what has been accomplished today. It was agreed that most challenges were correctly anticipated and successfully addressed which resulted in a better performance by ETN than expected. A. Williams remarked that only one challenge was not foreseen, which was the European impact of the recent shale gas boom in the US which resulted in a coal export to Europe widening the price gap between coal and gas.

Strengthen the users’ position within ETN:

It was acknowledged that ETN had performed well with regards to influencing policy and long term R&D challenges. C. Goy emphasised on the importance of continuing to have a strong involvement on EU policies and legislations. However, the Board agreed that the short term challenges addressing the day-to-day issues faced by the users could be improved further and that this would be crucial to strengthen the users’ position within ETN. It was agreed that ETN should put more emphasis on tackling short term issues and enlarging the user community within ETN. It was also agreed that we should strengthen the voice of the current user community. B. Quoix proposed that parallel to this we should open membership to users from outside Europe, which could both enforce our voice as well as bring in more R&D issues to address.

As a first step it was decided to contact ETN’s users and ask them to list their fleet of gas turbines as well as to identify their main technical issues per engine. The Board proposed the following items, among others, to be addressed in the survey:

1. Total fleet (type of GT and quantity);
2. Main issues classified by order of importance for their engines;
3. Frequency of issues, affects (peak\base), consequences (time to repair, cost), model, budget, presenting depot;
4. Commercial impact (high/medium/low);
5. Leave a section for comments.

ETN would use the expertise and knowledge within the ETN platform to address the issues identified by the user community.

Action: UK and GL to create a questionnaire template to be circulated to ETN’s user community.

Action: ETN office to circulate the questionnaire to the user community and collect the replies.

Opening membership to users outside Europe:

The Board agreed that the timing to widen the strategy was right and that the importance to cooperate on research and innovation has even grown due to the changing market in Europe and high policy uncertainties. With regard to the proposal to open-up ETN to organisations outside Europe, the Board decided that we should keep ETN as a European organisation but that it would be beneficial to open membership to users outside Europe.

The following benefits of opening membership to the global user community have been identified:

- Give a stronger voice to ETN's user community;
- Allow ETN members to benefit from a wider user-driven organisation;
- Give ETN a larger fleet to draw conclusions from;
- Have a stronger impact on the issues identified by the users;
- Increase amount of industry-funded R&D projects;
- Increase the visibility abroad of the European research community;
- Provide ETN members with a better knowledge of the global market;
- Wider uptake of potential projects – wider market;
- Opportunity for more projects to be initiated due to increase of income (projects could be funded directly from the industry and/or members could benefit indirectly from the increase of membership).

C. Björkqvist proposed to identify an ambassador per region (e.g. China, Middle East, etc.) who could represent ETN interests abroad and increase ETN's visibility due to his/her wide network. However, due to concerns from some Board members with regards to the lack of control (e.g. how the ambassadors would use the name of ETN), it was decided not to implement this idea at this stage.

It was proposed and agreed that ETN should use courses similar to the former course given by Cranfield in Pau, France in June 2012 to highlight the benefit of being part of ETN. The courses would bring experts from the EU platform and would increase the knowledge of practicing engineers in gas turbine user industries as well as give them an overview of the design and performance of the entire engine.

U. Kaltwasser proposed to open membership for other industry such as steel, paper, energy from waste, chemicals, etc. However, it was agreed that since such industries often do not have sufficient interests in gas turbine, it would be difficult to bring them in as members.

User Groups:

The Board discussed the possibility to connect with user groups in Europe on specific engine, in order to discuss the issues that would be identified in ETN's user survey. It was recognised that it might be a challenge to align these user groups under an ETN umbrella as some groups are OEM lead or organised by individual organisers, where ETN would be seen as a competitor. However, it was acknowledged that ETN could make a difference in identifying major needs and push the technology development forward.

In the future, if ETN would arrange or coordinate such meetings, the following set-up was proposed:

- **Day 1:** Users would discuss the major issues they are facing;
- **Day 2:** Presentation by users of their main issues and specific outcomes of day 1 discussion. OEMs would then respond to the main issues which they should have received already two weeks before the meeting;
- **Day 3:** Third parties would present themselves and give presentations on how they could help in addressing their main issues which also should have been sent to them ahead of the meeting.

As a first step, the Board agreed that ETN needs to focus on getting more information on its own users. In parallel, ETN would identify user groups in Europe to discuss potential cooperation. As a second step, ETN would potentially explore partnership with selected user groups. Board members suggested getting in contact with Yrjo Komokallio, GTUsers since he is already coordinating such events and has an extended list of users.

Following ETN users group meetings, the main topics identified as a priority would be brought to the ETN Project Board for review and circulated on the ETN platform in order to generate interest and see if potential proposals could be initiated.

Action: CB to prepare a presentation for the AGM explaining and justifying the reasoning and opportunities to open-up ETN to GT users outside Europe.

Action: CB to contact Yrjo Komokallio, GTUsers to discuss partnership opportunities.

10. Discussion on the proposed changes on ETN's Articles of Association

The Board reviewed the Articles of Association and made some propositions in order to reflect ETN's current needs as well as to enable any future potential growth or pathways that ETN might take in the future. C. Björkqvist stated that it is important to keep the Articles of Association as general as possible and to add more details in ETN's Internal Rules, which are complementary to the Articles of Association.

The Board discussed the possibility to add one new category to the Articles of Association, the *Affiliate members*. This category would include user organisations from outside Europe. It was agreed that *Affiliate members* would not have the right to vote nor be represented in the Board. The Board recommended that the addition of a new category should not modify the vision and activities of ETN. It was recognised that the focus of ETN should remain on Europe and it was agreed that embargoed countries would be excluded from the enlarged membership.

The Board also discussed the possibility to extend and modify the rights of the *Associate members* (OEMs). The Board agreed to give the *Associate members* the right to vote. However, they would not have the right to be represented in the Board. It was also suggested that the *Associate members* should include European governmental organisations.

B. Quoix recommended keeping the Board members more than one year in order to avoid a completely different Board from one year to another. The board members welcomed his proposal and it was decided to propose this at the upcoming AGM. The Board decided to discuss the modifications of the Articles of Association further in a teleconference, set to take place on 13 February 2014 in order to be able to present the revised version at the next Annual General Meeting on 2 April 2014 in Paris. C. Björkqvist mentioned that he would have a lawyer/notary reviewing the document, following the Board's review. Therefore all changes discussed during the Board meeting are subject of approval from the Belgium legal authorities, followed by the General Assembly. If the General Assembly approves the

proposed changes, it was agreed that ETN would announce the new category of *Affiliate members* in a Press release in conjunction with Power-Gen Europe, as well as through all ETN communication tools.

Action: CB to modify the Articles of Association, in line with the Board's suggestions and circulate the document to the Board ahead of the next Board meeting in February 2014.

Action: Board members to finalise the proposed changes on the Articles of Association.

Action: CB to submit the Articles of Association to Belgium lawyer/notary.

11. Strategy implementation process and roadmap

The strategy implementation process and roadmap will be discussed further at the February teleconference call as well as in the July Board meeting, after the strategy discussed during this Board meeting has been agreed by the General Assembly.

12. International Gas Turbine Conference (IGTC) 2014

K. Geris presented the conclusions of the Conference Advisory Board (CAB) which took place on 8 October 2013. She reported that the set-up of the keynote and technical sessions would stay the same. For the *Keynote Session 2: Technical Requirements from Operators*, the Board noted that the session would be a good opportunity to present the results of the user survey that would be circulated to ETN user community (discussed on point 9 of the agenda). K. Geris also informed the Board that the CAB modified the keynote session 3 to cover global and regional markets. The Board recommended covering the following countries: China, India, South America (Brazil), Middle East, Africa and Russia. As only three or four speakers would be invited to speak, the final decision would be based on the quality of speakers ETN would be able to secure. It was agreed that the targeted speakers should be high-level representative able to give a good market overview. For the *Keynote Session 4: OEM Panel Discussion*, the board proposed to change the panel set-up from last year's panel and to ensure that speakers are on the same senior level.

K. Geris reported that ETN received 28 abstracts as of 9 December, although more abstracts are expected before the deadline (15 December 2013). It was acknowledged that ETN received less abstracts than the previous conference. The Board discussed whether the IGTC should shift from an "abstract conference" to an "invitation-only conference". The Board noted that this new set-up would allow the IGTC to address the issues that would be identified in the user survey in one of the session. Although the conference should address both short and long term challenges, it was acknowledged that ETN should emphasise further on the short term compared to the previous conference.

K. Geris informed the Board that the registration fees have changed. The price for the two first ETN representatives and the speakers is 375 euro (excl. VAT) and the price for non-ETN members is 740 euro (excl. VAT).

Action: BQ to invite contacts in Brazil and Middle East to speak at the IGTC-2014 under *Keynote Session 3: Opportunities in Regional Markets*.

Action: BQ to provide the name and contact information of the representative from Siemens Energy and Solar Turbine with regards to *Keynote Session 4: OEM Panel Discussion*.

Action: CB to discuss the Board suggestions with the CAB in January 2014.

13. High Level User Meeting and Dinner Debate

The Board discussed, as an alternative, the possibility to host the High Level User Meeting outside the European Parliament and host the event at a user's premises. This idea will be discussed further at the next Board meeting.

14. Upcoming Board meetings and events

Board Meetings

Event	Date	Time	Location
Board meeting (Teleconference call)	13 February 2014	15:00 CET	
Board meeting	1 st April 2014 (Ahead of the AGM)	12:00-6:00	Paris, France (Total)
Board meeting	9 July 2014	9:00-17:00	tbd
Board meeting	December 2014 (date tbd)	Time tbd	tbd

Upcoming ETN meetings and events

Event	Date	Location
OMSoP Consortium meeting	16-17 December 2013	Brussels, Belgium (ETN office)
CAB meeting	22 January 2014	Brussels, Belgium (ETN office)
Project Board meeting	29 January 2014	Brussels, Belgium (ETN office)
Air Filtration Workshop	20 February 2014	Brussels, Belgium
Annual General Meeting and Workshop	2-3 April 2014	Paris, France (Total)
H ₂ -IGCC Final meeting	13-14 May 2014	Brussels, Belgium (Laborelec)
High Level User Meeting	13 October 2014	Brussels, Belgium
7 th International Gas Turbine Conference	14-15 October 2014	Brussels, Belgium

15. Closing of the Board meeting

B. Quoix closed the Board meeting.

ACTION LIST

No	New Actions	Resp.	Date
1	CB to discuss the possibility for the user community to comment the agenda with the filtration companies.	CB	10 Jan 2014
2	CG to coordinate the presentation with Laborelec.	CG	31 Jan 2014
3	BQ to invite BP to the Workshop and to follow-up on the membership discussion.	BQ	14 Jan 2014
4	CB to follow-up with the debt collector and inform BQ if the company can't collect the fee so he could follow-up on this with Nabil Barakat.	CB	
5	CB to verify if we can implement a function on our website that enables us to see how many people visit the pages of IGTC 2008 and 2010.	CB	31 Jan 2014
6	CB and HH to present the Board a proposal to spread ETN reserves into different banks.	HH/CB	13 Feb 2014
7	CB to discuss CL's comment with the Project Board at the upcoming meeting in January 2014.	CB	29 Jan 2014
8	UK and GL to create a questionnaire template to be circulated to ETN's user community.	UK/GL	5 Feb 2014
9	ETN office to circulate the questionnaire to the user community and collect the replies.	CB	Feb 2014
10	CB to prepare a presentation for the AGM explaining and justifying the reasoning and opportunities to open-up ETN to GT users outside Europe.	CB	
11	CB to contact Yrjo Komokallio, GTUsers to discuss partnership opportunities.	CB	March 2014
12	CB to modify the Articles of Association, in line with the Board's suggestions and circulate the document to the Board ahead of the next Board meeting.	CB	January 2014
13	Board members to finalise the proposed changes on the Articles of Association.	Board	13 Feb 2014
14	CB to submit the Articles of Association to Belgium lawyer/notary.	CB	Before AGM
15	BQ to invite contacts in Brazil and Middle East to speak at the IGTC-2014 under <i>Keynote Session 3: Opportunities in Regional Markets</i> .	BQ	
16	BQ to provide the name and contact information of the representative from Siemens Energy and Solar Turbine with regards to <i>Keynote Session 4: OEM Panel Discussion</i> .	BQ	
17	CB to discuss the Board suggestions with the CAB in January 2014.	CB	22 Jan 2014

ANNEX 1

PENDING ACTION LIST (from MoM December 2013 Board meeting)

Actions	Outcome / Next action	Responsible
CB to present a more detailed enlargement strategy plan and provide the Board with a proposed updated version of the Articles of Associations at the December Board meeting.	Done.	CB
CB to make the 2008 and 2010 IGTC proceedings available on the ETN website.	Done.	CB
CB to propose updates to the Articles of Association.	Done.	CB
AW to follow-up with TransCanada, Shanahan and Rools Wood Group	Pending. AW followed-up with Shanahan and TransCanada and will follow-up after the first 2014 quarter.	AW
BQ to send the contact details of Markus Tacke's replacement to the ETN office and contact him in a joint effort with CB.	Done. BQ provided the new contact person (Mr Thierry Toupin).	BQ
CB to organise separate meetings with GE, Alstom, Ansaldo, MAN, Rolls-Royce Solar and Siemens to discuss potential R&D cooperation.	On-going. CB met with Franco Rosatelli (Ansaldo) and will talk to Phil Walsh (Rolls Rolls) since they express interest in the hybridisation call.	CB
CB to modify the Emeritus Club proposal with the Board's suggestions and circulate it to the Board for approval before the official launch.	Done. The Board welcomed the proposal and suggested to add a sentence regarding conflict of interest.	CB
Board members to provide new names (if any) to the contact list of potential members (users).	Done.	Board
BQ to provide ETN with contact information for BP (US and Europe).	Pending. BQ tried to invite them for the AGM in Paris and will send them another email, copying GL, who is also in contact with them.	BQ
AM to provide ETN with new contact information for Gasunie.	Done. New contact is W.J.M. Keesom.	AM
RR to contact the new contact person at Gasunie about membership.	Pending. RR contacted them twice but his contact is not reacting. AM wrote an email to W.J.M. Keesom and is waiting for answer.	RR/AM
CL to contact RWE about membership.	Pending. CL was in contact with RWE but reported that the timing is not right. CL will follow-up at a later stage.	CL
CL to contact Mitsubishi about membership.	Pending. Mitsubishi Power System will merge with Hitachi Power System in 2014 for the GT department. CL will contact them when the merge is finalised.	CL
CB to contact Yrjo Komokallio for new contact information and to discuss potential partnership opportunities.	Pending. Y. Komokallio might attend the AGM in Paris. CB will organise a meeting with him.	CB

PENDING ACTION LIST (from MoM March 2013 Board meeting)

Actions	Outcome / Next action	Responsible
UK to follow up with GKN for membership in a meeting set to take place at the end of December 2013	<i>Pending.</i>	UK
CB and Board to prepare plan to approach EP and EC	<i>Postponed.</i> CB to prepare a package for new MEP and commissioner after the elections.	CB
ETN membership discussion with Ross Moffat at Scottish & Southern Energy.	<i>Pending.</i> CB suggested contacting a senior contact at SSE which he met at EC and copy AW.	AW/CB
UK to meet with Bo Pedersen of Maersk to discuss ETN membership.	<i>Pending.</i> UK to follow-up.	UK