WEAthens2014 Final Report

11th January 2015

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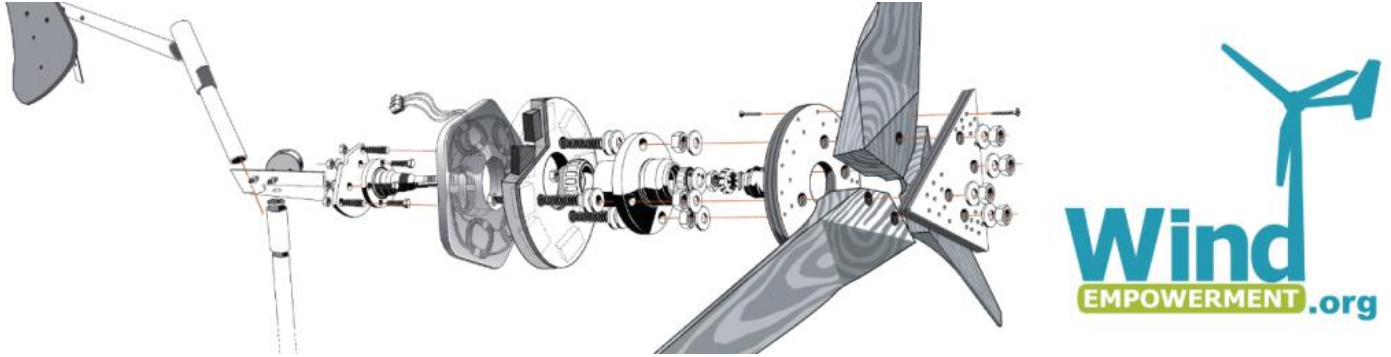
Executive summary

From the 3rd to the 7th November 2014, the Wind Empowerment association hosted its second global conference on small wind for rural development, WEAthens2014. The event was hosted at the National Technical University of Athens (NTUA) in Greece and brought together actors working in the field of small wind for rural development from 17 different countries in Latin America, Africa, Asia and Europe. The aim of the event was to stimulate international exchange between these actors and foster future collaborations that have the potential to make locally manufactured small wind turbines a more viable technology for sustainable rural electrification.

An action packed program of panel presentations and discussions, small group sessions, laboratory demonstrations, practical workshops, field trips, poster and technology exhibitions and more ensured that there was no shortage of opportunities for sharing lessons learned.

The participants were divided into Working Groups (WGs), designed to address the key barriers facing small wind for rural development. Providing this open space for knowledge exchange and discussion allowed North/South links to be developed with the aim of allowing the resources and expertise of organisations based in the Global North to fuel the development of those in the Global South, as well as facilitating direct South/South connections to share lessons learned and promote future collaboration. Throughout the week, each WG was tasked with developing a group vision and a roadmap of short, medium, and long-term actions that would allow them to achieve this.

A new executive board was appointed and the recently redeveloped digital platform, WindEmpowerment.org, was launched with the aim of providing an inclusive and globally accessible hub for this global community to continue to collaborate regardless of geographical location. Both WindEmpowerment.org and the executive board continues to evolve around the structure of the WGs, as if properly supported, they can be powerful vehicles of change, developing technical improvements, new measurement systems and more effective delivery models for wind-based electrification.

Although slow to start, fundraising for the event was ultimately, much more successful than expected: grant funding from Terre Humane, WISIONS and Green Empowerment, together with a crowd-source funding campaign totalled €42,630. As expected, the majority of the expenditure (€15,520) was on international travel. Together with food, local transport, publicity, hospitality, stationary, crowd source costs and bank fees, the expenditure for the conference totalled €19,163, leaving us in the fortunate position of having a €23,467 surplus. This was discussed during the open meeting of the executive board that was held during the conference and it was agreed that in order to fully capitalise on the momentum gained during the event itself and ensure that the great ideas for collaboration are turned into reality, it would be wise to invest these funds in the longer-term activities of the network. The following activities were identified, quantified and agreed upon:

- Funding the previously voluntary coordinator role
- Maintaining, hosting and continuing to develop the online platform, WindEmpowerment.org
- General administrative costs (printing, stationary, digital file sharing tools etc.)
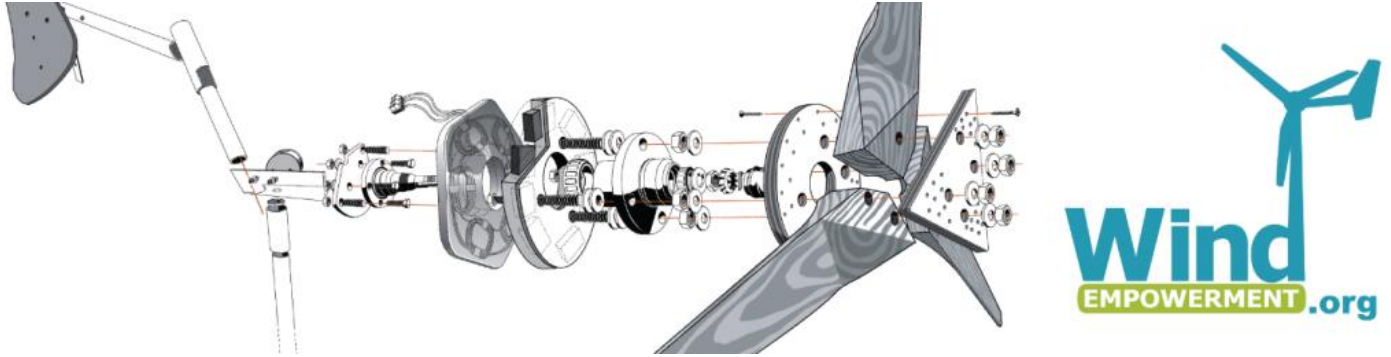
- WE2016 Conference
- Creating an operating reserve for emergencies
- Creating a Working Groups project fund

The event was evaluated with input from the participants themselves via feedback forms. Whilst the feedback was generally extremely positive, the following lessons were learned:

- *Planning*: fundraising for the next conference should begin as soon as possible and the work required to organise an event such as this should not be underestimated, however there are a number of digital tools that can assist this process, which should include the participation of WE members wherever possible.
- *Inclusivity*: language was a major issue, however the presence of many bi- and tri-lingual people helped significantly, early fundraising and a wider promotion of the travel scholarships should help improve African participation and the introductory presentations and small group sessions were really successful in encouraging all participants to engage with the other participants.
- *Technology*: the live link, livestreaming and video recordings offered those who could not be present at the event itself the opportunity to participate, but their effectiveness could be improved even further.
- *Timetabling*: timekeeping was a constant battle throughout the week as too much was packed into the program, which resulted in the valuable social time in the evenings and breaks where lasting personal relationships are built being reduced.
- *Decision making*: having a facilitator for the meetings where many people were present was extremely helpful, all WGs eventually came to a consensus, however they required sufficient time and space to do and the need for a more open and inclusive decision making process for the association was highlighted.
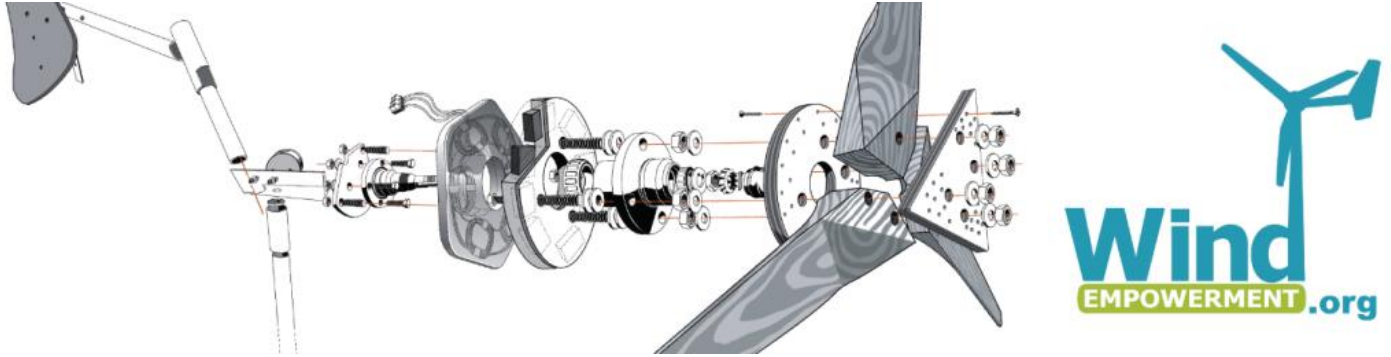
Wind Empowerment aims to support the development of locally manufactured small wind turbines for sustainable rural electrification by strengthening the capacity of its members through collaboration and knowledge exchange and there is no doubt that WEAthens2014 was a significant step forward in achieving this aim. However, if the momentum gained during the conference is to be fully capitalised upon, there is significant work to be done in order to build and maintain the required social infrastructure (executive board, WindEmpowerment.org, WGs). Fortunately, we are in a strong financial position, meaning that going into 2015, the future of wind-based rural electrification is bright.

This event would not have been possible without the support of our generous sponsors (The WISIONS Initiative, The Wuppertal Institute, Germany; Terre Humaine, France; Green Empowerment, USA; and all those who donated to the crowd-sourcing campaigns), the volunteer organising committee and our kind hosts, Nea Guinea and RurERG, NTUA.

Contents

1   Introduction, Background and Context

Previously, there were many unconnected organisations around the world that were using small wind power to electrify rural areas, with varying levels of success. In 2011 in Dakar, Senegal, many of these organisations met for the first time and formed the Wind Empowerment association with the aim of bridging the geographical gap between its members by providing a global platform for knowledge sharing and collaboration.

Shortly after the inaugural event in Dakar, the online platform WindEmpowerment.org was created, which allowed knowledge to be exchanged via webinars, a document library, a discussion forum, news articles and of course, by Skype and email. However, despite the staggering array of digital technologies available to us in the modern world, a follow up in person meeting was essential to allow our members to discuss their experiences face to face, share practical skills and build lasting relationships in a way that simply is not otherwise possible.

Consequently, from the 3rd to the 7th November 2014, the Wind Empowerment association temporarily emerged from the virtual world, as the National Technical University of Athens (NTUA) kindly played host to our second global conference. The aim of WEAthens2014 was to stimulate international exchange between actors working in the field of small wind for rural development. Specifically:

- Strengthen North/South links to allow the resources and expertise of organisations based in the Global North to fuel the development of those in the Global South.
- Foster South/South collaboration to share lessons learned and promote future collaboration.
- Build a global community to facilitate collaboration regardless of geographical location.

The event brought together participants from Argentina, Peru, Brazil, Palestine, Senegal, Nepal, India, UK, Netherlands, Luxembourg, France, Germany, Spain, Nicaragua, Austria, Belgium and, of course, Greece. It provided a fantastic opportunity for people following similar paths on opposite sides of the globe to share their experiences relating to small wind for rural development. The membership of Wind Empowerment is extremely diverse, consisting of universities, research institutions, NGOs, social enterprises, co-operatives, trainers, technological institutes and more, as well as over 1,000 individual participants. This event highlighted the fact that it is precisely this diversity that is the association's greatest strength, as each member has different experiences, making the collective experience of Wind Empowerment extremely rich.

2   Structure of the event

The program included presentations of previous work, field trips, practical workshops and most importantly time to develop a plan for lasting collaborations between members. The full program
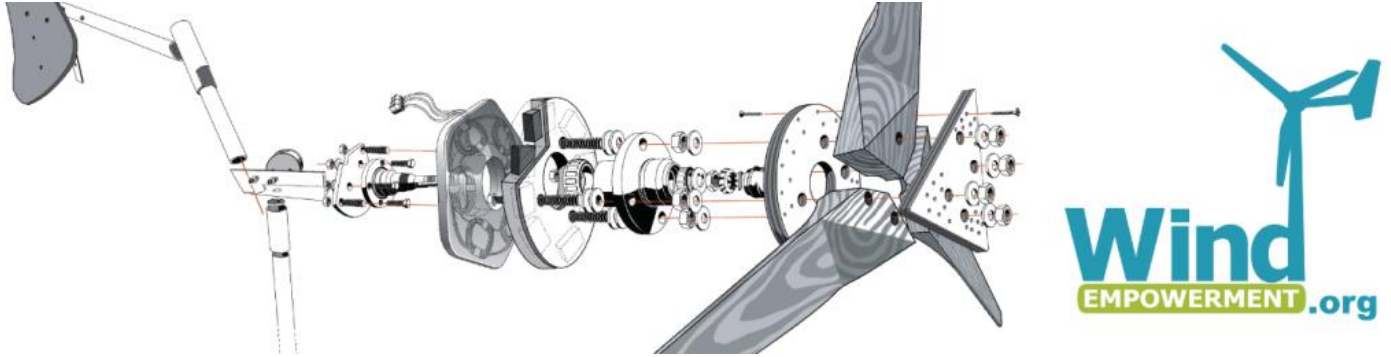
can be found in *Appendix 1 – Timetable* or in more detail on the conference website, WEAthens2014.WordPress.com.

The event began with a keynote address by Hugh Piggott, the original designer of much of the technology in use around the world today. Hugh told the story of how he solved the problem of the lack of access to electricity in his own community of Scoraig on the Northwest coast of Scotland by harnessing the power of the wind with a series of machines that have evolved since the 1970s. These machines have now spread across the world, allowing thousands more people to gain access to a sustainable supply of electricity, many of whom for the first time.


Figure 2-1: Hugh Piggott's keynote speech beamed live from Scoraig via GoToMeeting.

The emphasis throughout the conference was on maximising the opportunity for knowledge exchange during the event itself and promoting lasting collaborations. Consequently, an introduction to our host's NTUA & Nea Guinea's activities in Athens, was followed by three minute introductions to each organisation (and one minute of each individual) attending the conference.

This was followed by presentations from our members, divided thematically into Working Groups (WGs) to address the major challenges that are facing small wind in the context of rural electrification:

- *Market assessment*: small wind is a niche technology, so how can we identify regions where it could be a viable solution to the problem of lack of access to electricity?
- *Maintenance*: the question is not 'will it fall apart?', more 'who will put it back together when it does?' and 'how do they get access to the tools, spare parts and technical knowledge required to do so?'
- *Delivery models*: how can small wind turbines be successfully implemented within the social, economic, cultural and political contexts in which our members work?
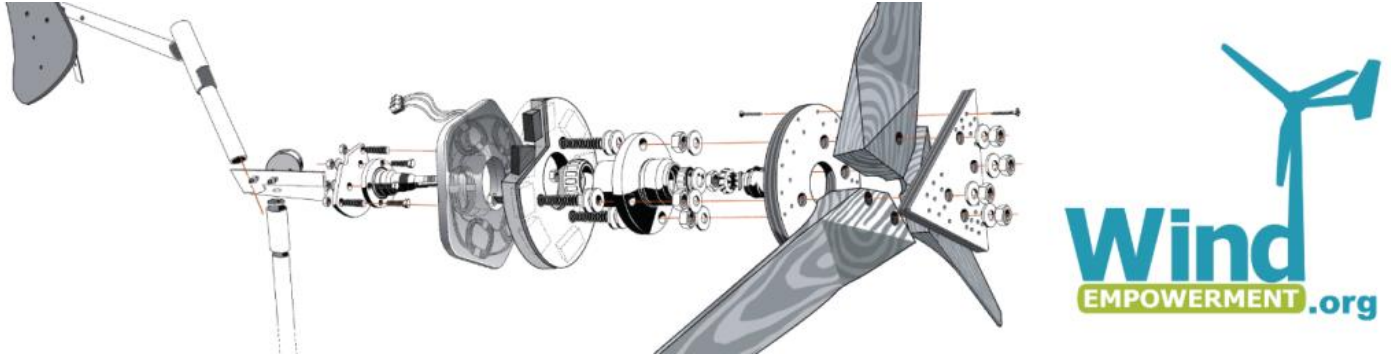
- *Technology*: innovative solutions to reduce costs, improve efficiencies and adapt the technology for new applications.
- *Measurement*: how do you measure the highly variable wind resource and the performance of systems that produce energy from it?
- *Education*: how can you transfer knowledge about SWTs most effectively?

Specific time was set aside during the week for these working groups to meet with each other and developing a long-term plan for collaboration, the outcomes of which are discussed later in *3.3Working Groups (WGs)*.


Figure 2-2: The NTUA test site in Rafina.

On the Wednesday, conference participants travelled to the NTUA's test site in Rafina, which is capable of measuring the performance of SWTs according to the IEC 61400-12-1 standard. A poster and technology exhibition also took place in Rafina, offering participants the opportunity to learn more and network in a more relaxed environment. Thursday saw the launch of three new open source software programs:

- WindSYS: developed at the NTUA for modelling and designing wind electric systems with direct battery connection.
- OpenAFPM: developed at the NTUA for modeling and designing AFPM generators in wind electric systems.
- OpenMicroGrid: developed by the UPC (Universitat Politécnica de Catalunya, Spain) for the design of off-grid electrification projects.

This was run in parallel with the following practical demonstrations:

- Bench testing of AFPM (Axial Flux Permanent Magnet) generators using a variable speed DC motor drive.
- Blade rotor aerodynamic testing in the NTUA's closed loop wind tunnel.
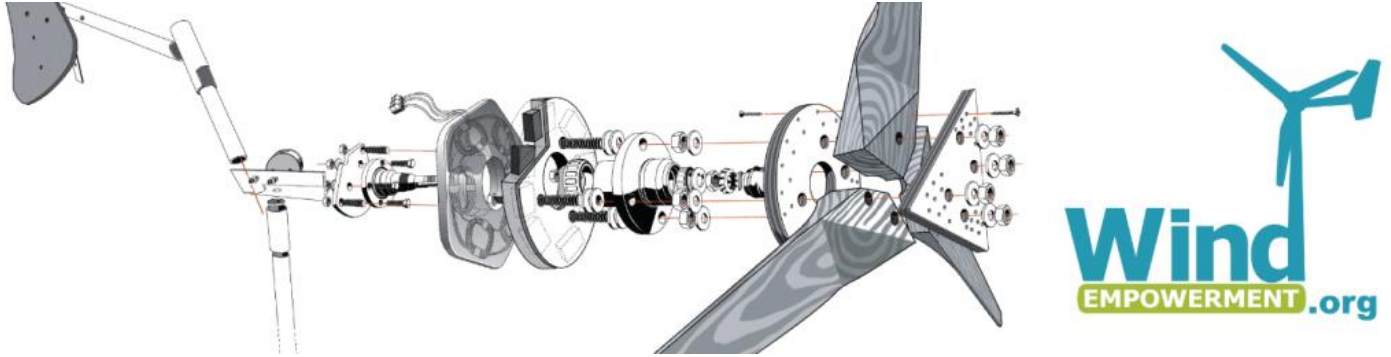
- A practical workshop on an open-source datalogger for wind resource assessment.

Figure 2-3: Preparing the NTUA wind tunnel for the laboratory demonstration on Thursday.

Michel Bauwens of the Peer2Peer Foundation spoke wisely about the open source movement, the creative commons and the Wind Empowerment association to a public audience in the centre of Athens on Thursday evening. Finally, the week culminated with a trip to the legendary Marathonas, where the conference co-hosts, Nea Guinea had installed two SWTs to provide power for an experimental eco-community, Spithari.org.

3 Outcomes

3.1 Executive board meeting

An open meeting of the executive board was held during the conference to give all participants with an interest in the running of the association the opportunity to have an input. Although this slowed down the decision making process, it was successful in engaging a large proportion of the membership (around 20 people) in the decision making process. It became apparent that some of the membership had become disconnected with what was happening in the association and would like to have been more involved in the decision making process.

As a result, it was decided that measures should be taken to make the executive board's decision making process as open and inclusive as possible in the future. To achieve this, a Google Group has been created, which will automatically translate messages into the user's chosen language, allow
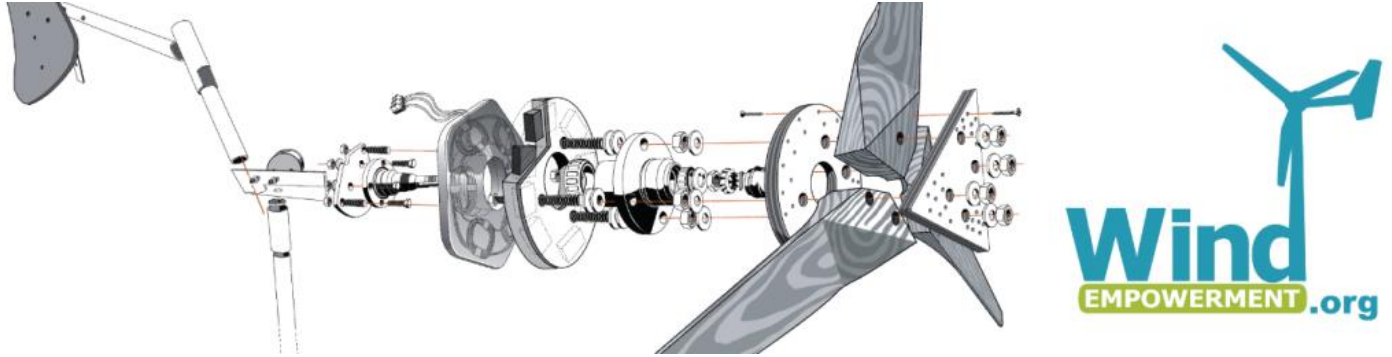
people to read, re-read and post their response at a time convenient for them. The minutes of the board meeting in Athens, together with those of all subsequent meetings are posted on this forum.

During this meeting, the executive board positions required to run the Wind Empowerment association until the next conference in two years' time were agreed upon. Anybody interested in filling these positions was asked to state their intention and those present at the meeting came to a consensus on the best person to fill each position. The following positions were appointed:

- Coordinator: Jon Sumanik-Leary
- Treasurer: Aran Eales
- Secretary: Luiz Lavado Villa
- Fundraising coordinator: Jessica Rivas
- Working Groups (WGs) coordinators: Esteban van Dam (Social) and Kostas Latoufis (Technical)
- Web master: Jonathan Schreiber & Andy Burrel

3.2   Facilitating future knowledge exchange and collaboration

WindEmpowerment acts as both a central knowledge bank and a facilitator of direct connections between its members (see Figure 3-1). A contact list containing a photo and the email addresses of all the participants was assembled during the event and circulated to the attendees shortly after to facilitate direct connections between WE members. This will form the basis of a searchable database of experts within WindEmpowerment.org, listing their skills and experience and allowing users to connect directly with the most relevant expert on the particular subject they are interested in.

The association's newly redeveloped digital platform, WindEmpowerment.org was launched during a participatory workshop at the conference. Participants learned about the WordPress platform and how they can build this collective knowledge bank by adding new material to the site, which is essentially a multi-author blog. The Google Group discussion forum was also demonstrated during this session, however in response to the needs of the WGs to have a space of their own, a separate Google Group has since been created for each WG, which will be moderated by the WG coordinator.

A database for projects implemented by WE members was presented at the conference and a similar database for the reviews of products and vendors relevant to WE members is currently under construction. What is more, the hugely successful series of webinars is set to continue, with monthly recorded broadcasts in 2015 offering the best presenters from WEAthens2014 the opportunity to go into more depth than the 10 minute presentation format at the conference itself allowed.

The first two days of the conference were streamed live on the internet offering those who were unable to attend the event in person the opportunity to participate. What is more, all of the presentations from WEAthens2014 were recorded and are now available for download from WindEmpowerment.org meaning that there is now a permanent record of each presentation made at the event that is searchable within the Wind Empowerment online library. This will allow anybody with an interest in the topics discussed at the conference to easily find this information at any point in the future, regardless of whether they attended the event or not.
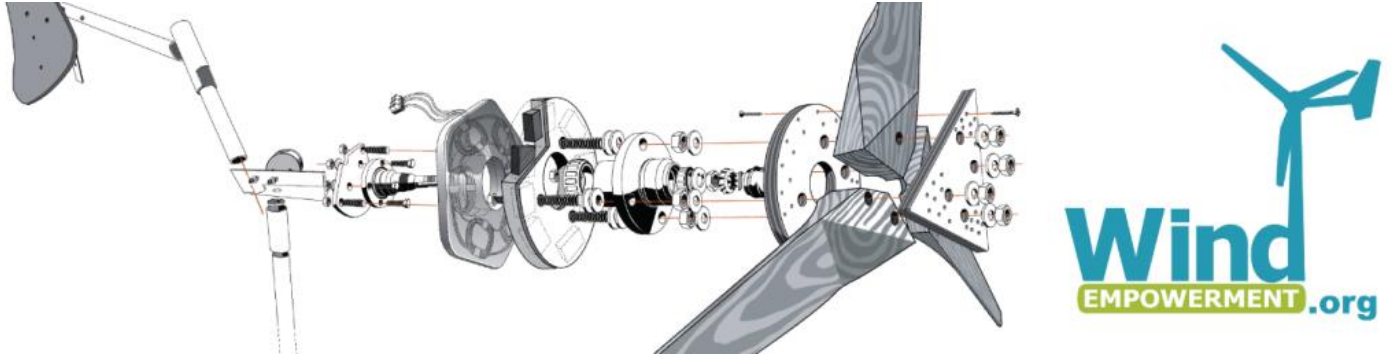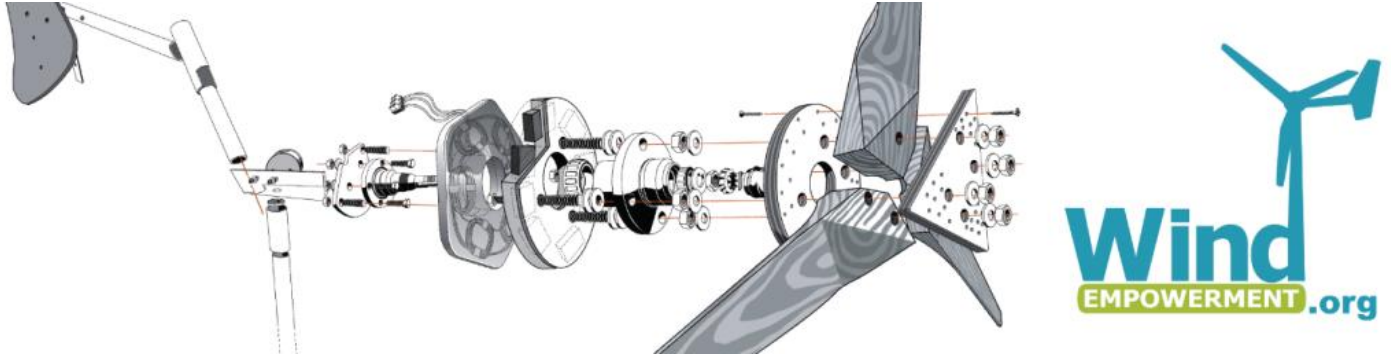
3.3   Working Groups (WGs)

Before the conference, two coordinators were assigned to each WG and tasked with contacting and introducing the group participants, as well as ensuring they were all aware of what and when they were presenting on the first two days. During the conference, they chaired their WG panel presentation sessions and facilitated the two small group sessions, with the aim of developing a shared group vision:

- *Education*: Being a global hub to facilitate the delivery and development of wind energy education, to empower others to contribute to continuous improvement.
- *Market assessment*: To develop an open source methodology for assessing economic, social and technical viability of locally manufactured small wind turbine implementation.
- *Delivery models*: Investigate delivery models and develop tools for the optimum implementation of small wind turbine projects around the world.
- *Technology*: To empower small wind turbine manufacturers through the research and deployment of open source technology that has the potential to make small wind systems more attractive and globally accessible.
- *Maintenance*: To mutually empower people to keep their turbines running.
- *Measurement*: To exchange technical ideas, collaborate and work towards standards and best practice for developers and end users for wind resource assessment and small wind turbine performance and optimisation.

Figure 3-2: The panel discussion at the end of the measurement WG session.

Each WG also agreed upon a series of short- (6 months), medium- (12 months) and long-term (24 months) actions that will work towards achieving their vision and came to a consensus on who would coordinate the WG up until the next WE conference in 2 years' time. On the final day, each WG presented this to the rest of the attendees, summaries of which can be found in

Appendix 3–Working Group (WG) summaries.

In the case of the maintenance working group, participants decided on a collective vision of mutually empowering people to keep their turbines running. This is achieved by creating a feedback loop that gathers experience from existing installations and directly informs maintenance practices, therefore empowering people to deal with failures of equipment that is already in the field more effectively.

Figure 3-3: Maintenance WG members with their roadmap of actions, group vision and flow diagram depicting their role. From the left, Jon Sumanik-Leary, Gaël Cesar, Pedro Neves, Bastien Gary, Emmanuel Muzaber. Not shown: Elad Orian.

This feedback loop would encompass both the association's member organisations and community participants. The community participants are members of the general public with an interest in small wind for rural development, many of whom may have a small wind turbine installed at their own home. As a consequence, collecting feedback directly from the end-users of the technology themselves offers them agency to declare what is working and what isn't for them and therefore influence the future direction of this constantly evolving open source technology. What is more, it will also enable the rethinking of future projects, so that the technology is designed and implemented in such a way that the major causes of failure are eliminated.
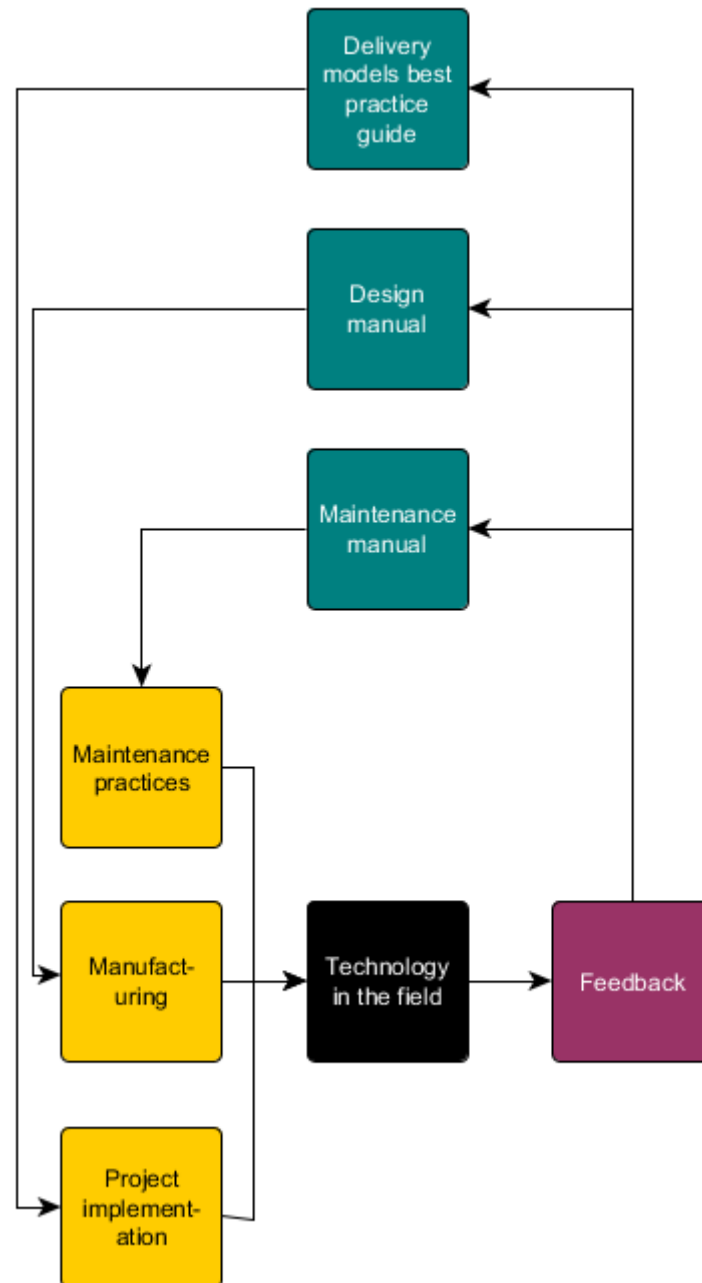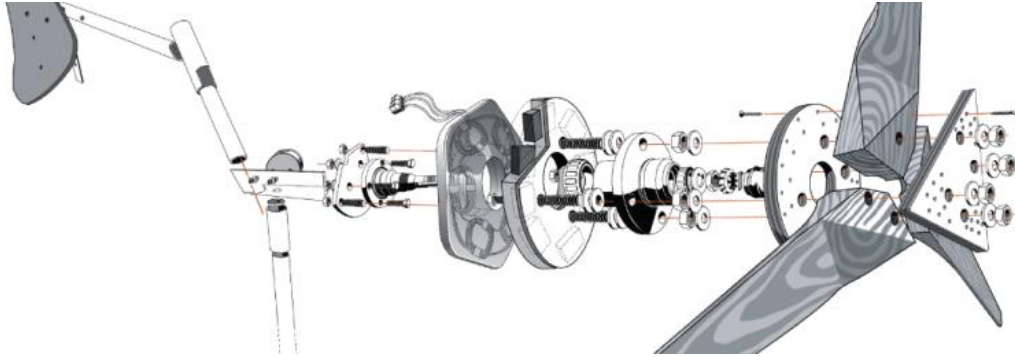
Figure 3-4: The role of the maintenance WG was identified as a feedback loop that increases the sustainability of technology in the field by collecting feedback from existing installations to inform maintenance practices, manufacturing and project implementation.

This process capitalises on the collective experience of Wind Empowerment members, as reliability data is notoriously difficult to acquire due to the fact that it requires long-term data collection across a large number of installations. Each member organisation has installed between 1 and 200 small wind turbines, however, together Wind Empowerment members have installed over 1000. What is more, they have been installed in different contexts, which also enables the comparison of the
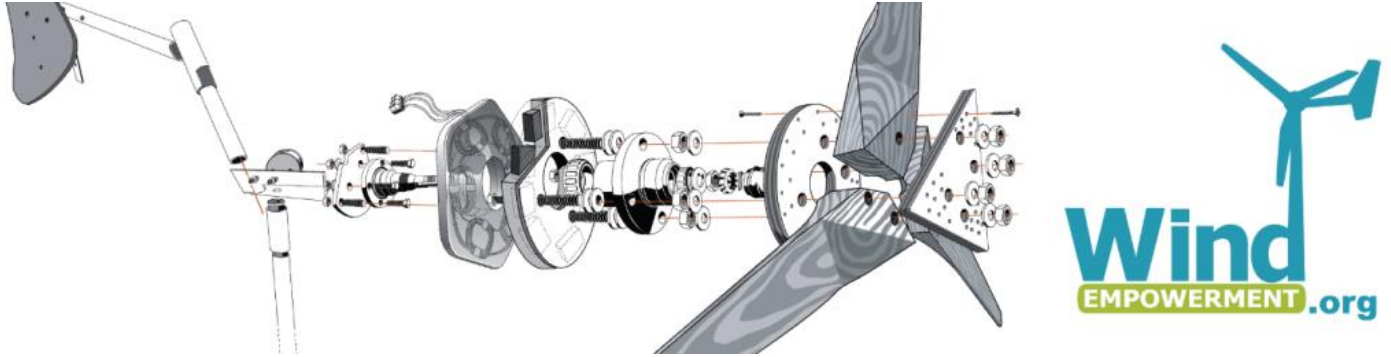
influence of environmental (e.g. lightning strikes), social (e.g. effectiveness of training methods) and economic (e.g. pay as you go vs. donor funded) factors to be determined.

In order to collect this data from Wind Empowerment members, a crowd-sourcing tool is required. As a short-term action, the maintenance working group committed to setting up a wiki-style platform on the recently redeveloped digital platform, WindEmpowerment.org. This will enable Wind Empowerment members to add their experiences of failures that have occurred with the machines that they have installed, together with their proposed solutions. Other members can add their experiences to this, creating a database of problems and solutions.

In the longer term, this data can be consolidated, validated by consensus among members and fed back into the system via the open source construction manual used by many Wind Empowerment members, the maintenance manual that has recently been developed by Wind Empowerment member Tripalium and the delivery models best practice guide that has been proposed by the delivery models working group.
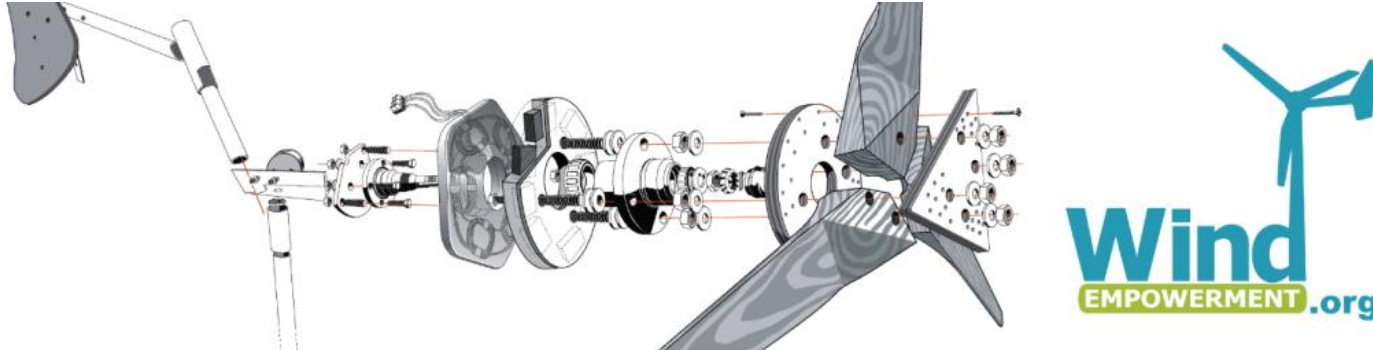
4   Finance

4.1   Fundraising

The need for a conference was identified by the Wind Empowerment executive board in November 2013. Soon after, Wind Empowerment members were consulted on whether they wanted to participate in such an event and if so, what they would like to see at the event, when would be most convenient for them and whether they would need assistance with travel costs in order to attend. The response was extremely positive, so in January 2014, a date was chosen and the search for funds began.

Over the next few months, a funding application detailing the need for a conference, the proposed activities and its participants, together with a financial breakdown of the funds required to realise this was drawn up collaboratively by the Wind Empowerment executive board and sent out to a range of potential donors. The initial response was almost non-existent, so two crowd-source funding campaigns were set up and the conference was redesigned to run on a minimal budget (free accommodation in the Nea Guinea workshop, no subsidised travel, no venue hire costs from NTUA etc.). Only one of the crowd-sourcing campaigns was successful, however this was sufficient to allow the event to take place. In the last two months before the conference, we were fortunate enough to secure three large grants, which primarily enabled us to cover participants travel costs and therefore widen participation in the event to include those who would benefit most from it, but would otherwise be simply unable to attend.

Table 1: Income secured for WEAthens2014.

Funding Source	Description	Amount
Terre Humane	The Foundation for Human Earth (FTH) supports and funds the work of the environmental groups. This fund was intended to cover international	€15,000

	transport cost for participants, to be administered by the Wind Empowerment group Tripalium.	
WISIONS	WISIONS supports clean energy in developing countries through developing regional networks, marketing and demonstration. The funding was originally for the conference, but could potentially be used to support follow-up activities. It was administered directly from the Wind Empowerment bank account in the UK.	€20,000
Crowd Source Funding	An Indigogo campaign was carried out to raise money for general conference costs. Administered by Wind Empowerment group Nea Guinea.	€2,030
Green Empowerment	Green Empowerment is a US NGO offering technical and financial support to facilitate access to clean water and electricity. Their WindWorks program was designed to create a network of Latin American small wind experts, which has now joined with the global Wind Empowerment network. WindWorks funds were made available to allow Latin American participants to travel to WEAthens2014.	€5,600
Total income:		€42,630.00

Table 2: Expenditures for WEAthens2014.

Item	Description	Amount
International travel	Door to door travel costs subsidised at 80% for participants who were unable to fund their own travel from alternative sources and at 100% for those who would otherwise be unable to attend. Please see *8.2Appendix 2 - List of Attendees* for a full breakdown. Includes €269.30 international transfer fees.	€15,520.12
Food	Lunch and dinner was provided for all attendees each day of the conference. The majority of meals were supplied by the university cafeteria, with external catering required only for the field trips and the Thursday evening before the public session. Included in this category are coffee and biscuits for the conference.	€1,904.70
Local Transport	Includes buses to transport participants from the university to the field trips, and taxis to the public evening lecture.	€592.86
Publicity	Posters, banner printing and other printing costs.	€576.07
Hospitality	Costs related to the workshop accommodation offered for free for participants such as sleeping mats, keys and hot water repair. Also included are cups for beverages used during the conference.	€151.85
Stationary	Flip charts, pens and paper required for discussions during the conference	€28.84
Crowd Source Costs	Running costs for the crowd source campaign including a percentage taken by IndiGoGo and PayPal, as well the cost of wind turbine recipe books given as a reward for donors.	€388.56
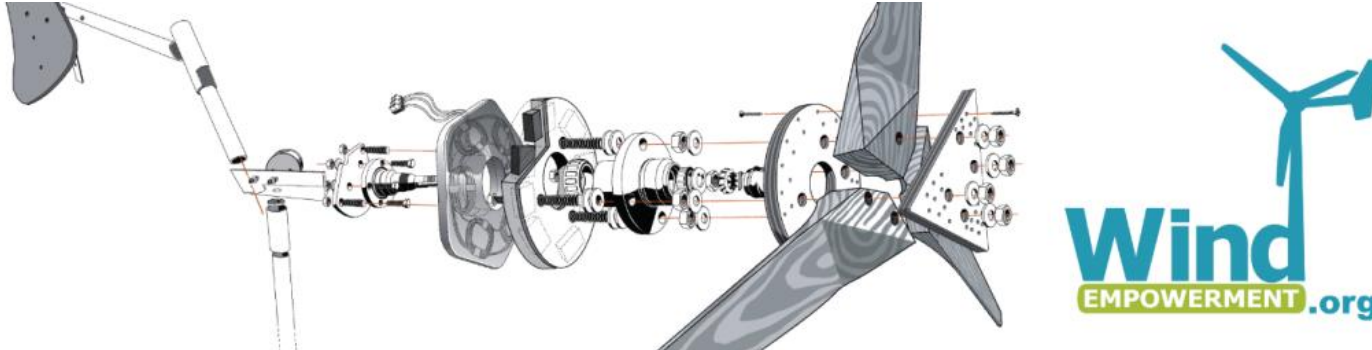
Total expenditure:	€19,163.00

Table 3: Remaining balance in the Wind Empowerment bank account after WEAthens2014.

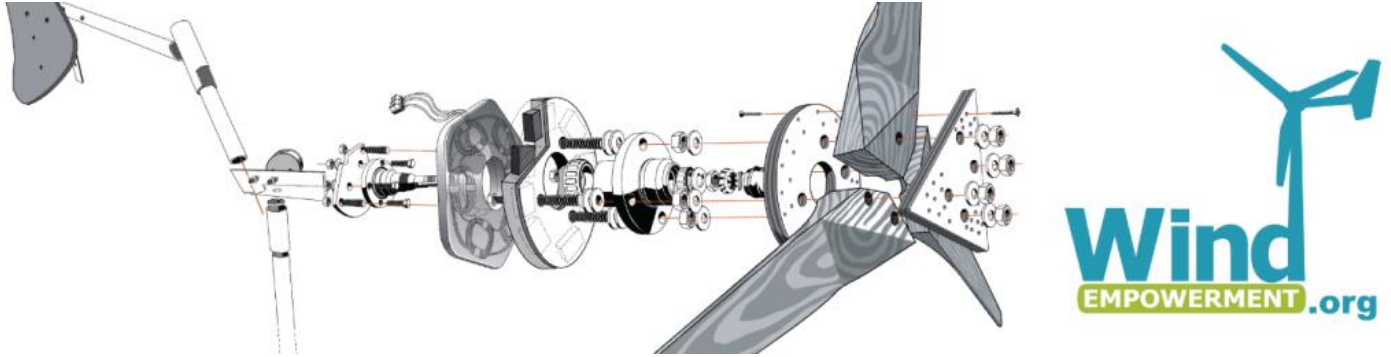| Income	€42,630.00
Expenditure	-€19,163.00
Balance	€23,467.00

4.2   Investing the surplus

As a result of obtaining these three large grants, we are now in the fortunate position of having a surplus of €23,467.00. An open meeting of the executive board was held during the conference to discuss how we could possibly use these funds in the most beneficial way. It was agreed that whilst we had been successful in building a huge amount of momentum for the conference, what was really important was sustaining this momentum and ensuring the actions we discussed during the event were carried out. It was agreed that using these funds as described in Table 4 would help ensure the long-term sustainability of the network and ensure that WEAthens2014 has the greatest possible impact for wind-based rural electrification around the world.

Table 4: Proposed allocation of remaining balance.

Item	Description	Proposed allocation of funds
Coordinator role	We agreed that the coordinator role was essential for facilitating future collaboration and that this could not be done effectively on a purely volunteer basis. Funding this role on a trial basis for 2 days a week for 1 year was agreed in the board meeting on Tuesday evening and as this was a key decision, this was confirmed with the entire group on Thursday. We planned for 48 working weeks per year and agreed on a daily rate of €120.	€11,520
WE.org	We agreed that as the web site is the core of the association that keeps us together between meetings, we should allocate €1,500 to follow up technical support whenever that may be necessary and €375 for 2 years of hosting.	€1,875
Administrative costs	We agreed that €1,000 should be allocated for administrative expenses, such as printing, publicity and file sharing tools such as Dropbox.	€1,000
WE2016 Conference	We agreed that it would be wise to reserve enough to cover the essential costs of the next Wind Empowerment conference in 2016. This will ensure that the event can go ahead with those who are able to fund their own international travel, even if we are unable to secure	€3,000

Operating reserve	We agreed on keeping an operating reserve in case of emergencies.	€2,000
WG project fund	We agreed that the remainder of the budget should be used to create a fund for our WGs to apply to, so that if they need financial assistance to buy equipment or travel to group meetings, then they can apply directly to Wind Empowerment. In order to do this, we would need to develop a standard application procedure (with assistance from more experienced organisations), whereby the working groups put forward a proposal for what they want to do, outlining the budget for the project, the external funding sources they have investigated and why they are not suitable. The executive board would review this proposal it and approve, recommend revisions with a resubmission or turn it down.	€4,072

5 Challenges & lessons learned

This section describes what we as organisers of WEAthens2014 learned from running the event. We hope this will be useful in planning the follow up event in 2016. Anonymous feedback forms were handed out to all participants on the final day of the conference. The feedback received was generally very positive:

"*It was incredibly good and very worthwhile for me to be there.*"

What did you like most about WEAthens2104?

- *"Finally getting to meet everyone and learning so much about what they're doing!"*
- *"I really liked the participation and the honesty of the debates and presentations"*
- *"The atmosphere was spot on – professional yet relaxed, global and happy"*

What did you dislike most about WEAthens2014?
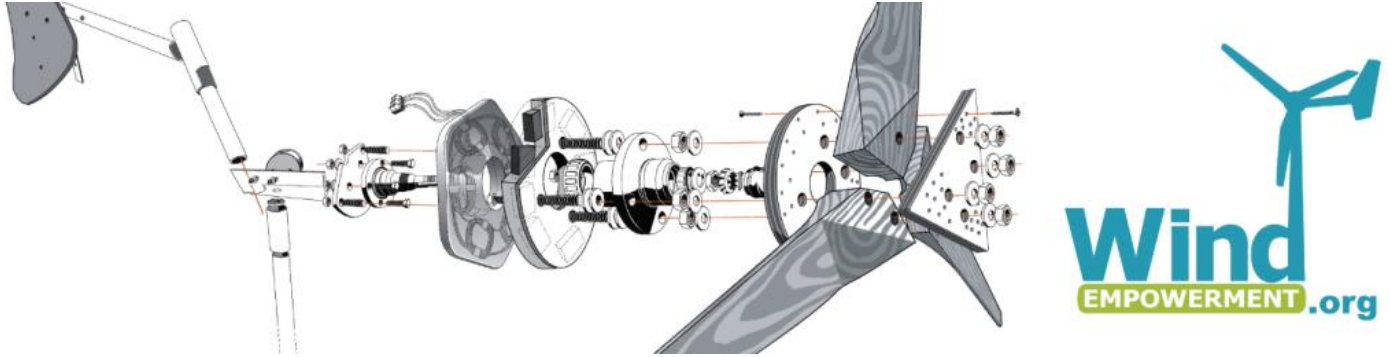
- "*It was so short!*"

Would you be interested in attending a similar event in 2 years' time?

- *"YES! It's the best way to work towards real progress…there's so much to learn from others' experiences and to work together on!"*

However, some important issues were also flagged up. The following section details these concerns, together with those of the organising committee.

5.1 Planning

- *Fundraise as early as possible* - It would be wise to start applying for funds earlier, even now! The fact that we only secured funding for international travel costs just a few months before the event meant that some participants were unable to attend due to the following reasons:
  - o *Visas* – can require over a month to process, so need to allow a minimum of 2 months' notice for people travelling from developing countries.
  - o *Awareness of funded places* - Some participants weren't aware of the availability of funded places, which shows the importance of having a clear and well publicised call for assistance with travel costs well in advance (at least 6 months) of the conference.
- *Planning committee* - Don't underestimate the time needed to plan and write-up an event such as this! A planning committee of 6 people were working on it from about a year in advance, which would be roughly equivalent to 3 months full time work for 1 person. Writing up the event, reimbursing the travel expenses and uploading the content to WE.org also required a significant investment of time after the event (roughly 1 month full time for 1 person).
- *WEAthens2014.WordPress.com,WEAthens2014@gmail.com& Google Docs* - The free WordPress site, a Gmail account and a Google Spreadsheet that all of the planning committee had access were invaluable in communicating with participants. Having a dedicated facilitator for each (building and updating the web site and responding to emails) was essential in order to ensure participants could obtain the information they needed when then needed it.
- *Participatory planning*– Including WE members as much as possible from as early as possible in the event planning ensured that the event was tailored to meet their needs rather than our best guess of what they wanted.
- *80% travel subsidy* – This worked very well, as it allowed a much wider range of participants to attend, yet encouraged commitment and early travel booking by subsidised participants. A 100% subsidy was granted to a small number of people who informed us that they were unable to attend without it.

5.2 Inclusivity

- *Language* – Although this was a major barrier, as the event was conducted entirely in English, the fact that there were many bi- or even tri- lingual people present meant that French and Spanish speakers with poor English skills were still able to participate thanks to the kind assistance offered by these people.Feedback originally written in Spanish: "*I'm really happy to have participated and even though at first, the language was a big barrier for me, as the days went on it got better and better, thanks to the kind assistance offered by all the participants of the event.*" Asking all the bi- and tri- lingual people to stand up at the beginning of the conference so that those with poor English skills could get in touch with them on the first day could have reduced this barrier even further. However, it would be wise to investigate further methods for overcoming this barrier at the next event in 2016.
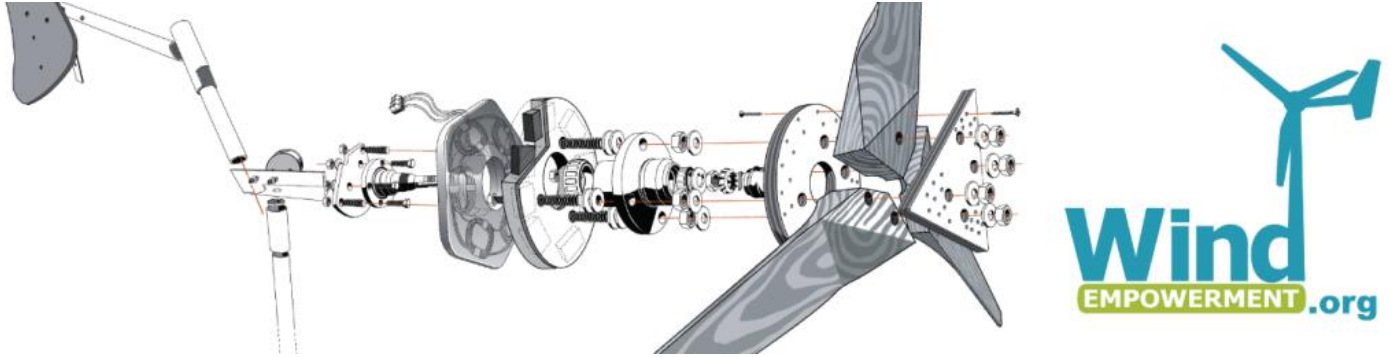
- *Low African participation* - There was only one African and not a single North American participant. The event was widely promoted in Latin America and Europe, however obtaining funding earlier and publicising this more widely amongst the African membership would have been beneficial
- *Public events* - The public evening lecture on Thursday was widely publicised and was a great success, however not a single person turned up to the public event on Monday evening. It's unknown exactly why this was, but the Thursday event was very clearly defined and well promoted to a target audience, whilst the Monday event was much more general.
- *3 min intros* - The introductory presentations worked really well, however it was a lot of work explaining the concept to participants and getting them to send their slides beforehand so that the session could run on time.
- *WG small group sessions* – These sessions were very effective in ensuring that each attendee was able to contribute to the debate, even if they were not presenting in the panel sessions. It also gave everyone a concrete route for continuing to collaborate after the conference.

5.3   Technology

- *Live link* - The livelink to Hugh Piggott in Scoraig for the keynote speech at the beginning worked well and the pressure was reduced as the session had beenrecorded the week before in case of any problems.
- *Livestreaming* - The livestreaming was a great feature to offer, but it wasn't possible to find out how many people were connected, so difficult to judge its impact. It could have been even better if the quality of the stream was higher (difficult to hear presenters and see slides) and people watching were able to ask questions. Would be worth investigating using GoToMeeting and broadcasting in the same way as the webinars.
- *Video recordings* - Presentations were recorded using both a DSLR camera and the livestreaming camera, which meant that there were two copies of each presentation. Without this, quite a few presentations would have been lost due to technical issues such as SD cards filling up, operators forgetting to turn on the camera, microphones not pointed in the right direction etc.

5.4   Timetabling

- *Timekeeping* – Too many presentations were crammed into Monday and Tuesday. Although the discussion session and coffee breaks were scheduled to be longer than necessary, they did not provide enough of a buffer zone. At least 90 minutes should be allocated for lunch and dinner and 30 minutes for coffee breaks. The workshops, software tutorials and laboratory demonstrations all ran over time on Thursday. The presenters who rehearsed their sessions only ran over by 10-20 minutes, whilst those that did not ran over by up to 4 hours!!
- *Don't underestimate the social aspect* - Building lasting collaborations requires a personal relationship, as well as a technical understanding of each other's work. Some of the most important decisions (including the structure of this report) were made in the more relaxed
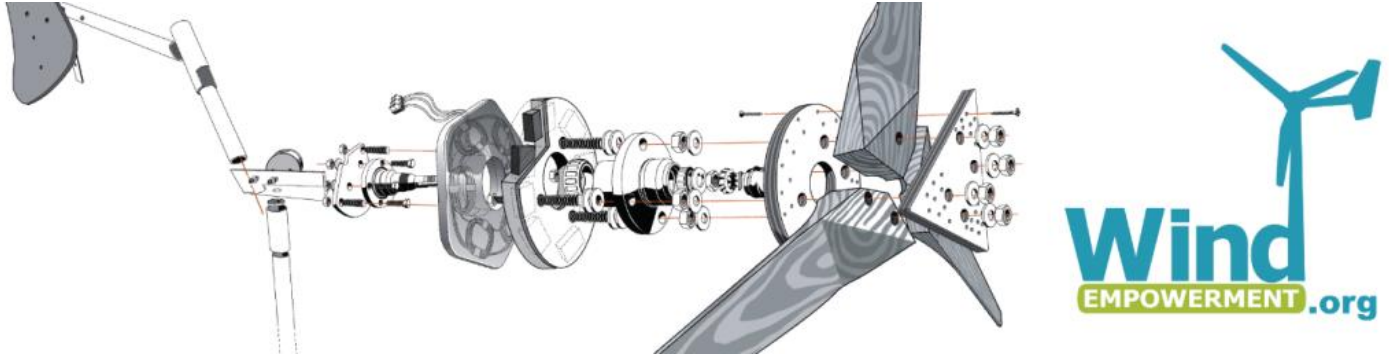
environment of the coffee/lunch/dinner breaks, the field trips or even in the bar. Putting the executive board meeting at 7pm was a disaster both because previous poor time-keeping meant that it didn't start until even later and also because nobody wanted to be sitting down having a meeting after a long day of formal presentations.

- *Feedback* - More time should have been allocated for participants to fill out feedback forms, as only around half were returned. This feedback shapes the follow up and next event, so it's vital that all voices are heard.

5.5   Decision making

- *Facilitator* - Coming to a consensus on difficult topics with a large group was almost impossible. Having a dedicated impartial facilitator was essential to keep the discussion focussed, ensure no one person was dominating and that the group came to a consensus.
- *Openness* – The heated debate surrounding Wind Empowerment projects illustrates the need to be more open about decision making within the association between conferences. This is addressed in *3.1Executive board meeting*.
- *WGs* - Not all WGs came to a consensus after their first small group session, the Market Assessment and Delivery Models group split in two and the structure of the Technology group continued to evolve even after the second small group session. Allowing sufficient time for this process to occur was seen as essential to the long-term sustainability of the WGs. A support document was written for WG coordinators and briefings given at the beginning of the event and immediately before both of their two hour sessions to ensure that they were able to make the most of the event. These were focussed on the role of the WG coordinator as a facilitator with the aim of uniting the WG towards a shared vision and building a roadmap for actions needed to achieve this.

6   Conclusion

WEAthens2014 was hailed as a great success by all who attended and the constant debate throughout the week showed that it certainly achieved its aim of stimulating international exchange between actors working in the field of small wind for rural development.The combination of structured panel presentations with guided small group sessions within the Working Group (WG) framework proved a highly effective tool for participants to build lasting collaborations by gaining a better understanding of the needs of Southern partners and of the skills/resources available to the Northern partners. This also allowed direct South/South links to develop, sharing lessons learned and promoting future collaboration between Southern partners. What is more, structuring the conference in this way enabled participants to develop personal relationships with their fellow group members and a sense of belonging to a group with a shared goal. The roadmap of actions provides a concrete pathway to achieving this goal that is specific, measurable, achievable and time-bound.

However, the question i swhether these pledges will translate into real action over the next two years. In order for this to happen, the momentum built up during the conference needs to be kept going. Fortunately the network is now in a very strong position, with a newly elected executive
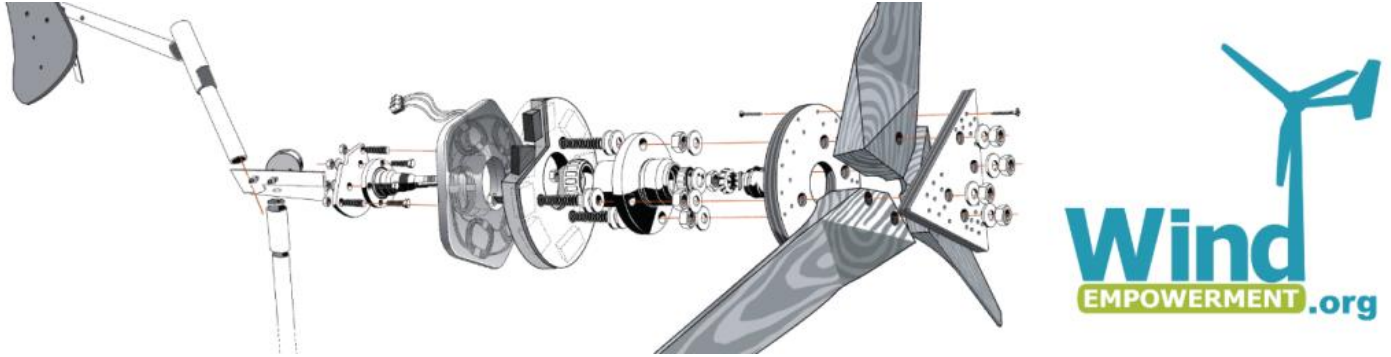
board, a recently redeveloped digital platform with a host of tools to facilitate global collaboration and sufficient funds to be able to maintain and further develop this social infrastructure. The future is bright for the Wind Empowerment association, meaning that the future is also bright for our members and therefore for the millions of people living in remote corners of the world for whom small wind turbines are the most viable means for obtaining a sustainable source of energy.

6.1   Acknowledgements

This event would not have been possible without the support of our generous sponsors (The WISIONS Initiative, The Wuppertal Institute, Germany; Terre Humaine, France; Green Empowerment, USA; and all those who donated to the crowd-sourcing campaigns), the volunteer organising committee and our kind hosts, Nea Guinea and RurERG, NTUA.

6.2   Further information

Find out more about WEAthens2014 from the following sources:

- The Sheffield Institute for International Development blog.
- The WEAthens2014 site.
- The Wind Empowerment site.
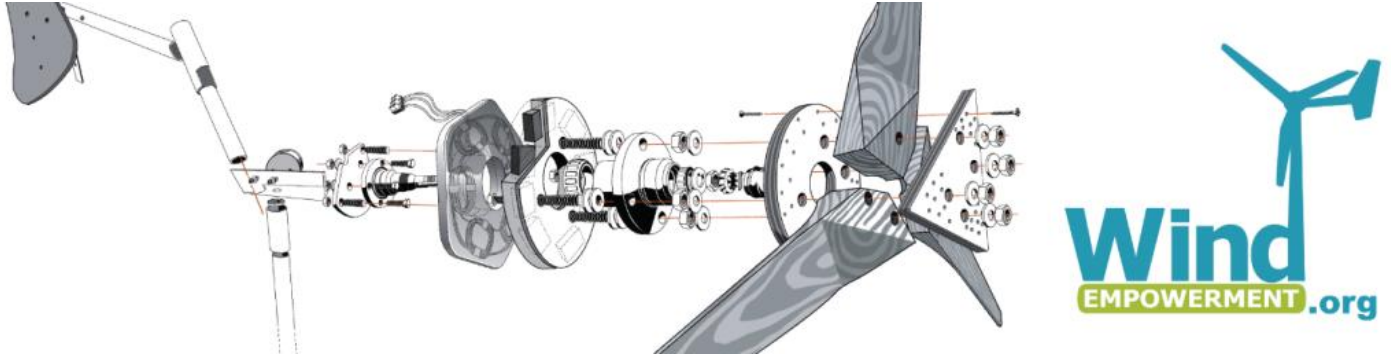
8   Appendix
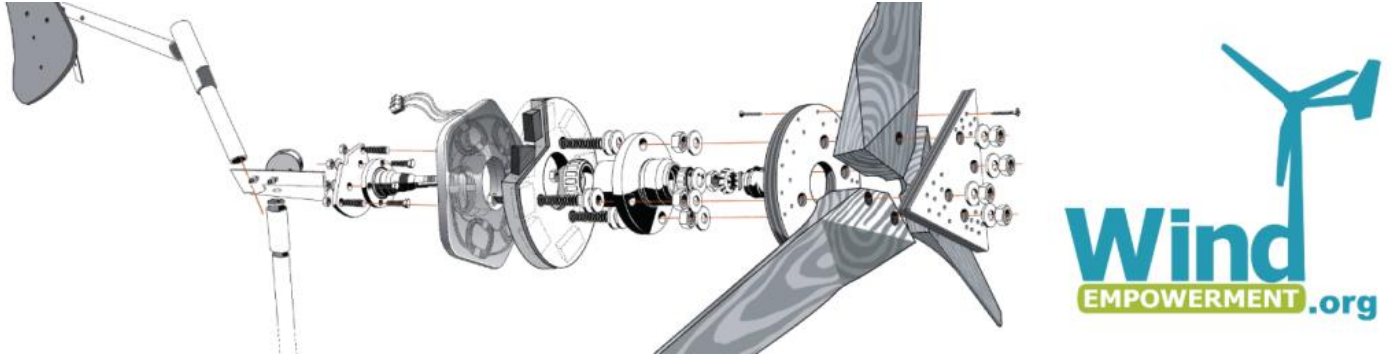
8.1   Appendix 1 – Timetable

Figure 8-1: Final timetable for WEAthens2014.

	Monday	Tuesday	Wednesday	Thursday		Friday
8:00 AM	Breakfast	Breakfast	Breakfast	Breakfast		Breakfast
9:00 AM	Introduction to Wind Empowerment	WG Presentations Market assessment & delivery models (2 1/4hrs) 30 min break Education (1 1/4hrs)	Field trip to NTUA small wind turbine test site in Rafina	Software & web site A	Lab demos & logger B	WG feedback 30 min break
10:00 AM	Hugh Piggott					Board meeting feedback & election
11:00 AM	30 min break			Lab demos & logger A	Software & web site B	
12:00 PM	Introduction from everyone					Closing session
1:00 PM	Lunch	Lunch	Lunch	Lunch		Lunch
2:00 PM	WG Presentations Technology (2 1/4hrs) 30 min break Maintenance (1 1/4hrs)	WG Presentations Measurement (1 3/4hrs) 30 min break	Poster & tech. exhibition + Networking time	UPC software tutorial (1 3/4hrs) 30 min break		Field trip to wind turbines in spithari.org in Marathonas
3:00 PM						
4:00 PM		WG small group sessions (1 3/4hrs)		WG small group sessions (1 3/4hrs)		
5:00 PM						
6:00 PM	Dinner	Dinner	Dinner	Dinner		Dinner
7:00 PM	Public Evening Lectures: Small wind turbines for rural electrification: how is it done?	Wind Empowerment open board meeting	Free time	Public Evening Lectures: Michel Bauwens: Distributed Energy for a Fair and Sustainable Distributed Economy and Society		Wind powered party!
8:00 PM						
9:00 PM						

Legend	
For all	
For registered attendees	
For board members & anybody with an interest in the how WE is run	

8.2 Appendix 2 - List of Attendees

Table 5: Attendees with funded travel

Representative	Member organisation	Country	amount (€)
Esteban van Dam	Eolocal	Argentina	137.64
Rafael Oliva	UNPA Rio Gallegos	Argentina	948.85
Andrés Zappa	INTI Neuquén	Argentina	931.31
Fernando Cembalo	National Parks Administration	Argentina	2,200.00
Emmanuel Muzaber	EWB Argentina	Argentina	1,058.90
Luciana Proietti	500RPM	Argentina	1418.19
Jessica Rivas	WindAid Institute	Peru	926.40
Luis Valdés	Celtab	Brazil	1,163.79
Cheikh Mouhamed Fadel	ÉolSénégal	Senegal	729.80
Jorge Ayarza	Minvayu	India	830.00
Jon Persson	Comet Me	Palestine	220.00
Kimon Silwal	KAPEG	Nepal	627.98
Isabel Ruiz Almeyda	I love windpower	The Netherlands	0.00
Piet Chevalier	I love windpower	The Netherlands	400.00
Marko Bosman	I love windpower	The Netherlands	116.00
Luiz Fernando Lavado Villa	University of Toulouse / LAAS-CNRS	France	225.35
Pedro Neves	BlueEnergy	Germany	215.00
Jay Hudnall	Ti'éole	France	Total for all French participants: 1,371.72
Gael Cesa	Tripalium	France	
Marc Delile	Tripalium	France	
Bastien Gary	Tripalium	France	
Benoit Lime	EolEcole	France	
Gilles Longuet	Tripallium	France	
Roland Vackenborg	I love windpower Tanzania	Netherlands	212.00
Matteo Ranaboldo	UPC	Spain	120.00
Jonathan Schreiber	PureSelfMade	Austria	213.31
Andy Burrel	V3 Power	UK	119.19
Tom Dixon	V3Power	UK	118.65
Matt Little	Renewable Energy Innovation	UK	167.56
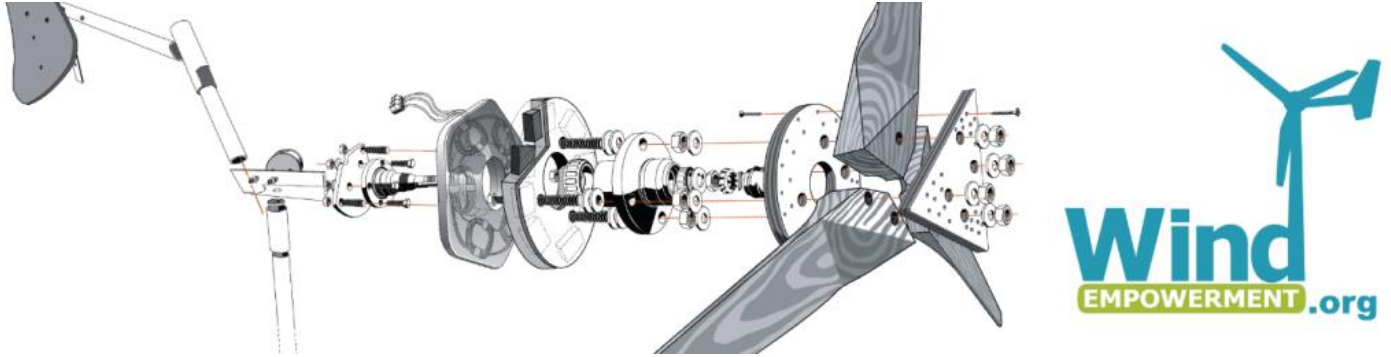
Jack Howe	V3Power	Scotland	388.26
Aran Eales	V3 Power	UK	390.90
		TOTAL	**15,250.82**

Attendee	**Organisation**	**Country**
Noam Dotan	Comet Me	Palestine
Elad Orian	Comet Me	Palestine
Zoe Ben	Centre for Alternative Technologies	France
Tom Wastling	The University of Sheffield / EWB-Sheffield	UK
Jon Sumanik-Leary	The University of Sheffield / EWB-UK	UK
Carmen Dienst	The Wuppertal Institute	Germany
Guy Putz	ATTENDEE	Luxembourg
Will Reiter	ATTENDEE	Luxembourg
Katerina Troulaki	RurERG-NTUA	Greece
Achilleas Tsitsimelis	RurERG-NTUA	Greece
Panos Kotsampopoulos	RurERG-NTUA	Greece
Kostas Latoufis	RurERG-NTUA/Nea Guinea	Greece
Thanos Kanatsoulis	RurERG-NTUA	Greece
Thomas Pazios	RurERG-NTUA	Greece
Kostas Latoufis	RurERG-NTUA	Greece
Giorgis Messinis	RurERG-NTUA	Greece
Alexandros Rontogiannis	RurERG-NTUA	Greece
Sofia Koukoura	ATTENDEE	Greece
Giannis	ATTENDEE	Greece
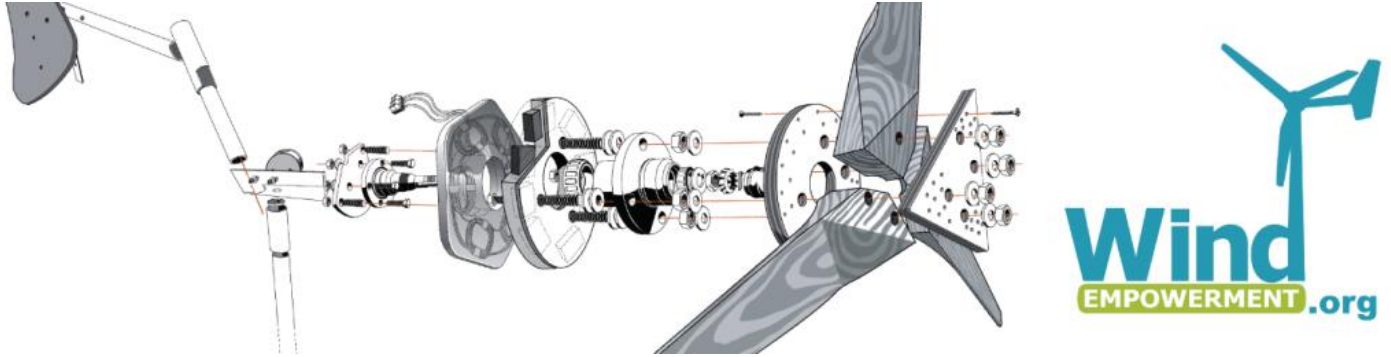
8.4 Appendix 3–Working Group (WG) summaries

8.4.1 Education WG summary

Coordinator: Esteban van Dam, 500RPM &Eolocal

Vision:Being a global hub to facilitate the delivery and development of wind energy education, to empower others to contribute to continuous improvement.

Short-term actions (6-month):

1. Report installations on WE site (on-going afterwards) – **not defined responsible**
2. Promote each other courses on mailing lists, etc. (on-going afterwards) - **not defined responsible**
3. Create a DropBox folder and share course materials (Videos, PPTs, manuals, etc.) - **Jack**
4. Create a platform on the website to allow access to experts (this could also include the whole "Education WG" platform on the site – **Jonathan/Andy**
5. Translate Tripallium maintenance manual – **Esteban - previous authorization from Hugh to Jay**

Mid-term actions (12 month):

1. Find a solution to uninstalled Wind Turbines – **Jay**
2. Improving and sharing Piet's idea of posters (Ikea style design) – **Jay**
3. Shared development of a small educational wind turbine, and document to explain concepts behind it – **Benoit, Esteban, Tom, Guy, Will**

Long-term actions (24 month):

1. Create a course for universities – **Esteban**
2. WE book – **Andy**
3. Partner schools or projects in different countries (jumellage program) - **Benoit**

Other possible ideas for future development:

1. Best practices guide through trainers participating in training courses abroad
2. Installation guide
3. Develop hydro course

8.4.2 Market assessment WG summary
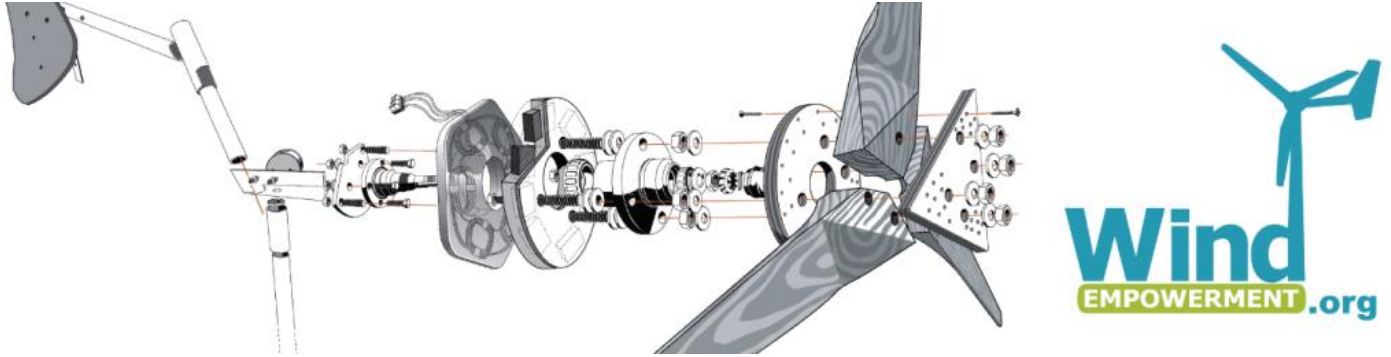
Wind Empowerment Philosophy:
Love for decentralized energy solutions, particularly wind
Empowerment of people
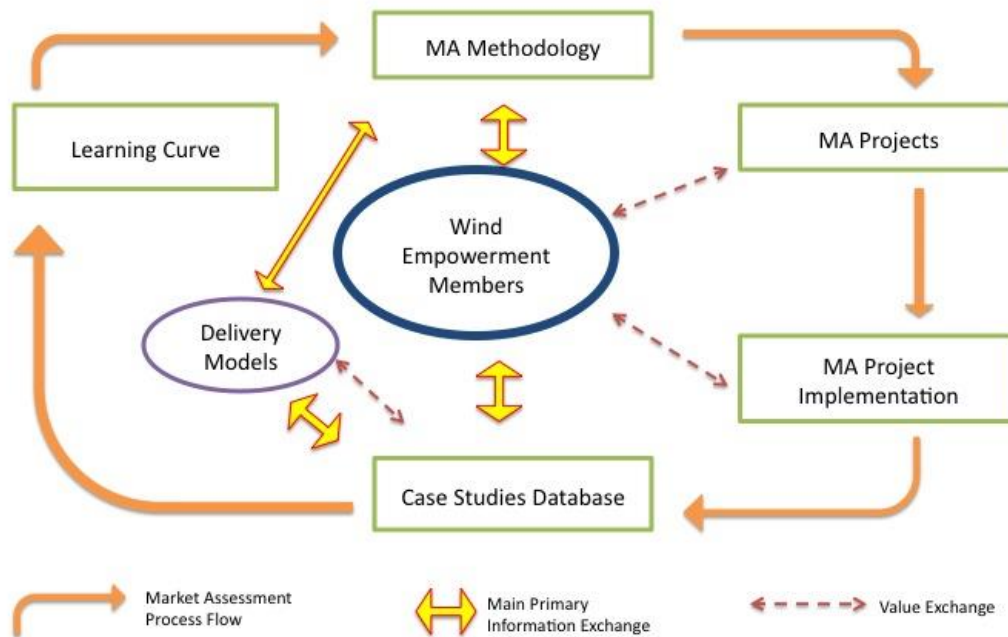*Love & passion for Hugh Piggott´s design + knowledge sharing*

Figure 8-2 Market Assessment WG workflow, representing both the vision and long-term actions of the WG.

Coordinator: Isabel Ruiz Almeyda

Short-term actions (6-month):

- Define & Share MAG definition & plans
- Find out what has already been done in terms of:
    - People
    - Case Studies
    - Tools
- Define Market assessment methodology
- Establish (Formalize) relationships with Delivery Models Working Group (DMWG) as well as with the other Wind Empowerment Working Groups (WEWGs)
- Skills share (MAWG-WEWGs)
- Kick off MAWG
    - Ethiopia
    - Measuring campaign

Mid-term actions (12 month):

- Publish methodology
- Methodology validation
- Training
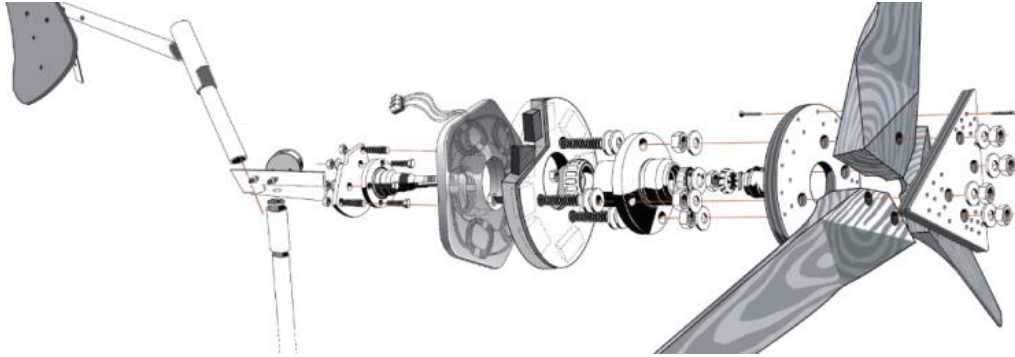
- Conducting projects using the/a methodology
- Research funding chase

8.4.3 Delivery models WG summary

Vison: Investigate delivery models and develop tools for the optimum implementation of small wind turbine projects around the world.

Coordinator: Zoe Ben, CAT

Group Organisation*:* monthly meeting of around 1 hour (Doodle, GoToMeeting, skype etc…)

Short-term actions (6-month):

GOAL: Gather Information from literature and WE projects

HOW:

- Create a reading group (Dropbox or other)
- Amend Template
- Collect projects information (both in writing and via interviews when more convenient & populate the database

Mid-term actions (12 month):
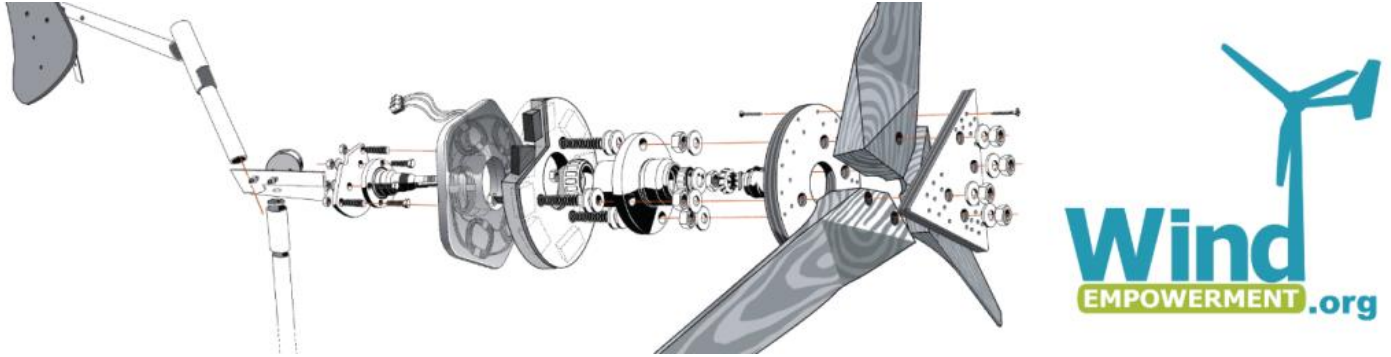
GOAL: Analysis and Evaluation

HOW:

- Sorting data
- Extract success factor, common challenges, and ways of work
- Decide on which format for best presentation (decision chart, projects catalogue etc…)

Long-term actions (24 month):

GOAL: Develop methodology/tools/pathways for action

HOW:

- Case Studies, Scenarios
- Decisions Chart
- Manual

8.4.4 Technology WG summary

Vision: To empower small wind turbine manufacturers through the research and deployment of opens source technology that has the potential to make small wind systems more attractive and globally accessible.

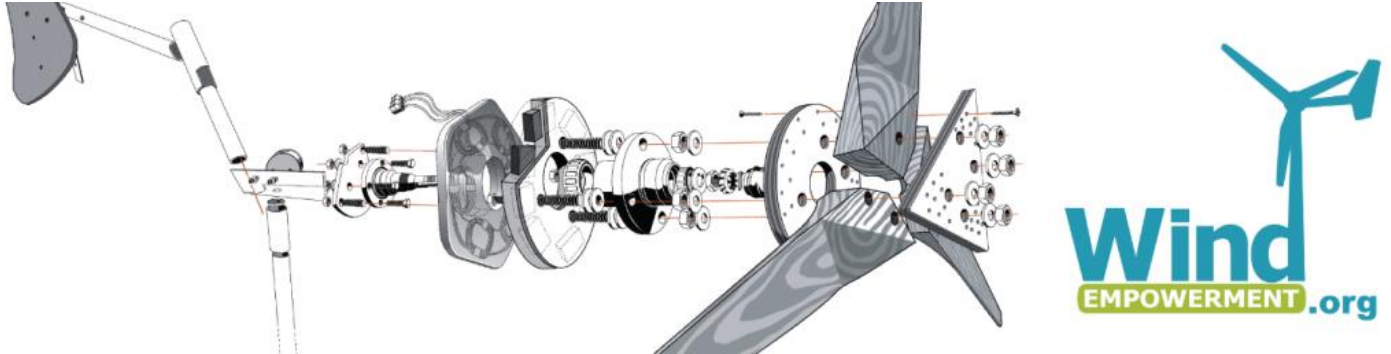**Coordinator**: Luiz Lavado Villa, University of Toulouse

Structure of the WG:

- WG Coordinator - The coordinator takes care of the communication within the group and the proper documentation of projects.
- Theme specialist - The specialists are responsible for putting together and managing the projects within their area of specialty.

Decision making process and project assembly

The WG has agreed on the need of a method for streamlining the creation of projects while caring for their impact and quality. This project creation process will be put together before Christmas and a webinar will be called to explain it to the WE community.

Once this process is in place, it will be used to elaborate pre-projects which will be handled to the specialists for initial development. The WG will decide, as a whole, the projects that have a higher priority and those which may wait a little longer for maturation.

Short-, mid- and long-term objectives

Figure 8-3: To turn the mission of the WG into reality, the group has devised a 2-year plan of activities:

The description of each group of actions and its specific actions is given below.

Project Organization group of actions

- **Decide a project method** - It is important for the WG to have a cohesive and solid method for creating and archiving projects. This project needs to be decided as a group and put into action as soon as possible.
- **Webinar** - Once the project method has been decided, the group will organize a webinar for explaining it to the rest of the WE community.

Project Creation group of actions

- **Gather data form the community** - With the project methodology chosen, the WG will start gathering information from the WE community to create new projects.
- **Shape proposals** - Based on all the created projects from the community needs, the WG will shape proposals and organize the resources needed.
- **Write a global 6 pack proposal** - After the WG meeting, the WG will endeavour to write up a proposal of a global project composed of 6 sub-projects.

WG meeting organization
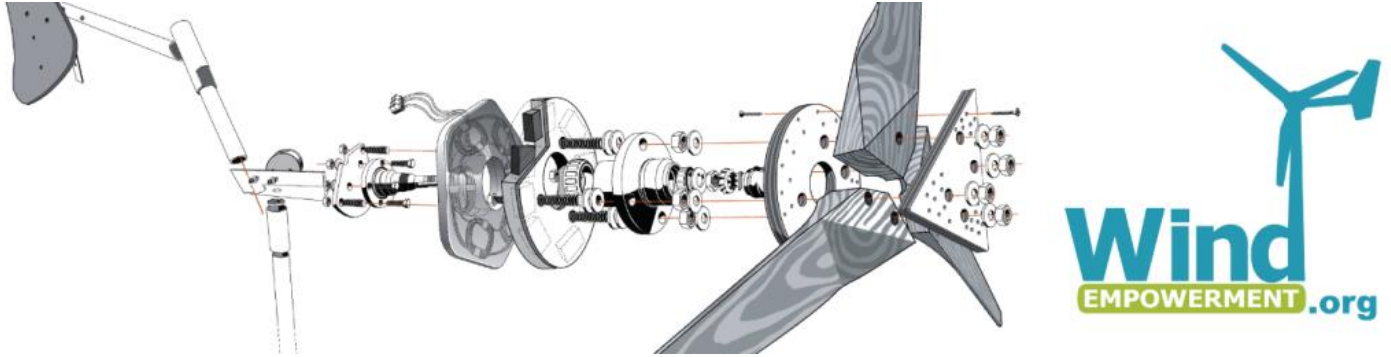
- **Organize the technology WG meeting** - After one year of running projects and organizing data from the community, it will be important for the WG to meet somewhere in the world to evaluate the advances and projects underway.
- **Shape proposals** -

Running Projects group of actions

- **Run the first project** - The first WG project should be up and running by the end of 2015.
- **Run a global project** - Based on the first project experiences as a group, the WG should be running a global project with several actors in several continents by the end of 2016.

Turbine Open Manual group of actions

- **Think about the platform** - In order to efficiently write an open manual, the WG should first decide what form it should take and in which platform it should be written.
- **Decide the platform**- Based on a study of the different platforms, the WG should choose one by the beginning of 2015.
- **Create a FAQ**- As a first experience of collective writing, the WG should elaborate a FAQ based on the recurrent questions from people around the world to Hugh.
- **Write a first version of the manual**- The group should have a first draft of the turbine open manual before the next WE Conference.

8.4.5 Maintenance Working Group Summary

Vision: To mutually empower people to keep their turbines running.
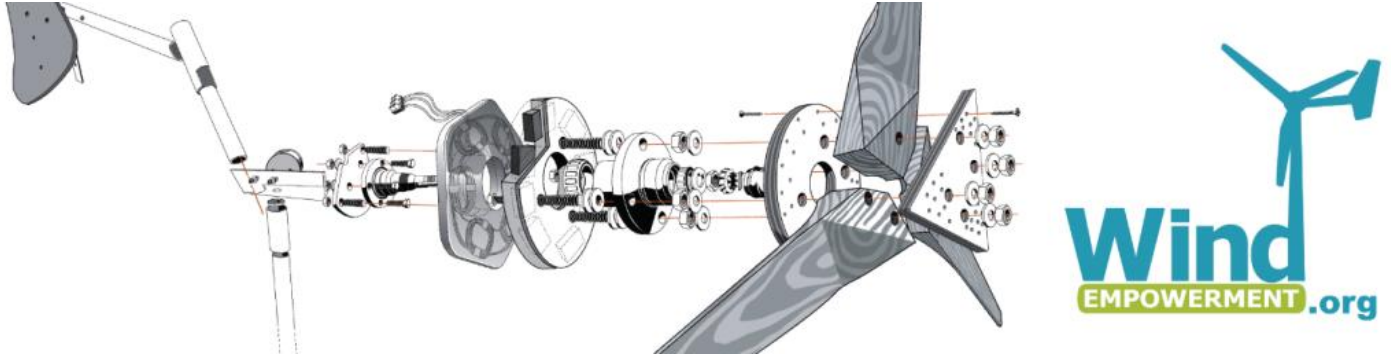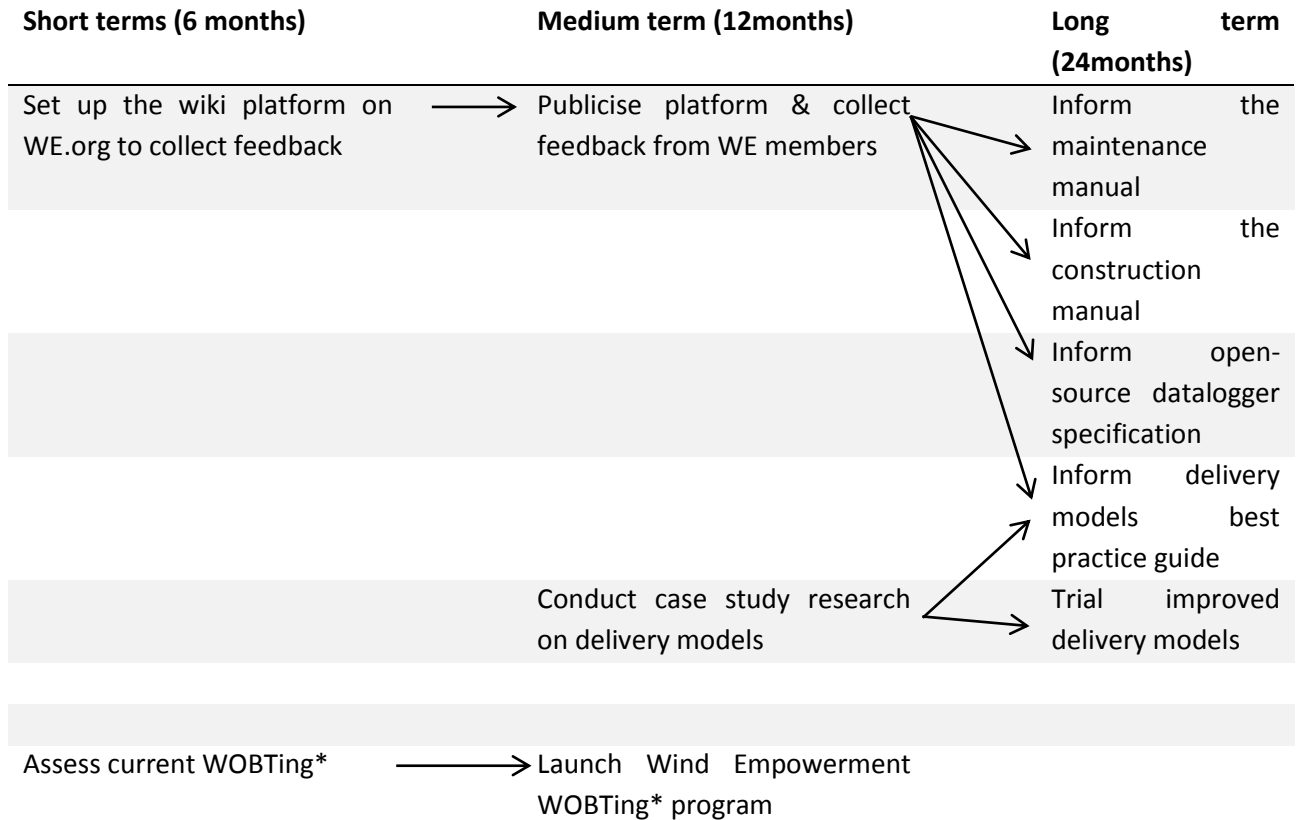
Coordinator: Gael Cesa, Tripalium

Short terms (6 months)	Medium term (12months)	Long term (24months)
Set up the wiki platform on WE.org to collect feedback	Publicise platform & collect feedback from WE members	Inform the maintenance manual
		Inform the construction manual
		Inform open-source datalogger specification
		Inform delivery models best practice guide
	Conduct case study research on delivery models	Trial improved delivery models
Assess current WOBTing*	Launch Wind Empowerment WOBTing* program	

Additional info:

- *W.O.B.T.: Working On Broken Turbines. Similar to the WOOFing network (Working on Organic Farms)
- Inform manuals/best practice guides: come to a consensus on the most useful feedback from WE members about what works and what does not & send it to those who compile these documents.
- Case study research on delivery models: reviewing existing installations to learn about what works and what does not.
- Trial improved delivery models: trialling new methods of implementing SWT projects in order to improve their sustainability.
- Inform open-source datalogger specification: decide on which parameters are the most useful to measure on an SWT for maintenance purposes, e.g. rotational speed to investigate whether the turbine has been over-speeding, and send this information to the measurement working group.
- Assess current WOBTing*: collate information on examples where WOBTing is already going on in order to inform a potential WE WOBTing program.
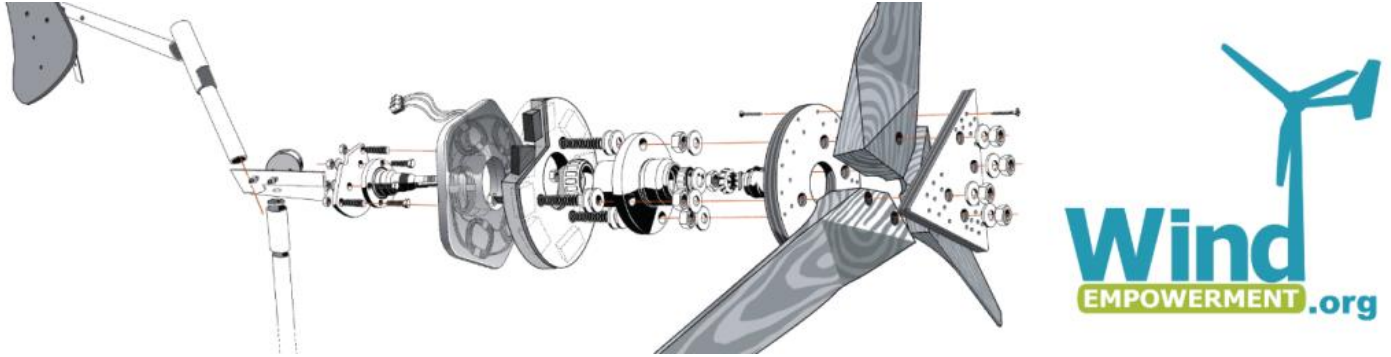
- Launch Wind Empowerment WOBTing program: create platform to link volunteers with SWT owners & installers who are looking for help to repair their SWTs. A map of these broken turbines could be useful so that potential volunteers can find the SWTs nearest to them. SWT owners & installers could offer WOBTing volunteers something in exchange for their assistance, e.g. food or accommodation.

Actions:

Gaël:

- Collate and share WOBTing info
- Co-ordinator (of maintenance working group).
- Collate existing maintenance manual.

Jon:

- Send W.O.B.T.ing info to Gaël.
- Work with Jonathan and Andy to develop wiki platform.
- Add case study info to wiki.

Bastien:

- Summarise notes and send around.

Emmanuel:

- Add Argentina info to wiki.

Pedro:

- Add Nicaragua info to wiki.

8.4.6 Measurement WG summary

Vision: To exchange technical ideas, collaborate and work towards standards and best practice for developers and end users for wind resource assessment and small wind turbine performance and optimisation.

Short-term actions (6-months)

Create community:

- Work with other working groups
- Open and accessible
- Low barrier to entry

Standards research:

- Define needs and targets
- Study of international standards (IEC etc.)
- Documentation framework for projects
- Standards for hardware and software

Medium-term actions (12-months):

Modular datalogger project:

- Wish list for modular datalogger
- Standards for software and hardware

Long-term feedback:

- Data from 'from the field'
- Comparison with commercial products
- End-user feedback

Long-term actions (24-months):

Wind Empowerment product:

- Develop robust, reliable and accurate equipment
- Open design
- Suitable for WE members to use in small wind projects

Things to do:

Organise online collaboration forum:

- (e.g. Google Groups) This was discussed briefly in Athens. People seemed to want a more open-source base than google groups. I am of the opinion that it needs a low barrier to entry (i it has to be easy to join and use) rather than fully open source.
- More research is needed. Any input to this is appreciated

Organise a repository for information and collaborative documents:

- Via the WE website?
- Via a drop box? (so we can add to documents)
- Via a wiki? (maybe just add to wiki likeEnergypediahttps://energypedia.info/wiki/Main_Page)

Research international standards and find useful documents

- This will probably require access to University library

Gather experience of measurement activities:
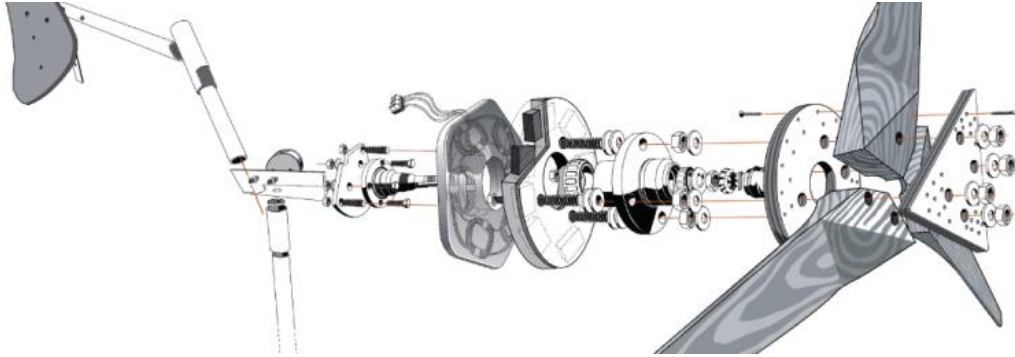
- This is happening via emails of experience.
- Need a more formal way of documenting thins information

Organising a WE gathering for reviewing projects:

- A long weekend working on datalogging projects was raised.
- I think this is a great idea.
- Looking to meet, probably in France, in April 2015.
- Funding opportunities required to cover costs.

A DIY anemometer 'hack' day was also proposed:

- This needs organising and dates setting.

It was suggested that WE buy a number of different anemometers for testing

- These could be then used to calibrate lower cost/DIY units.

WE could also own a number of high accuracy Wind measurement devices

- These could be used by members at their sites then moved to other members (e.g. collective use)
- This idea needs full proposal done along with costs.
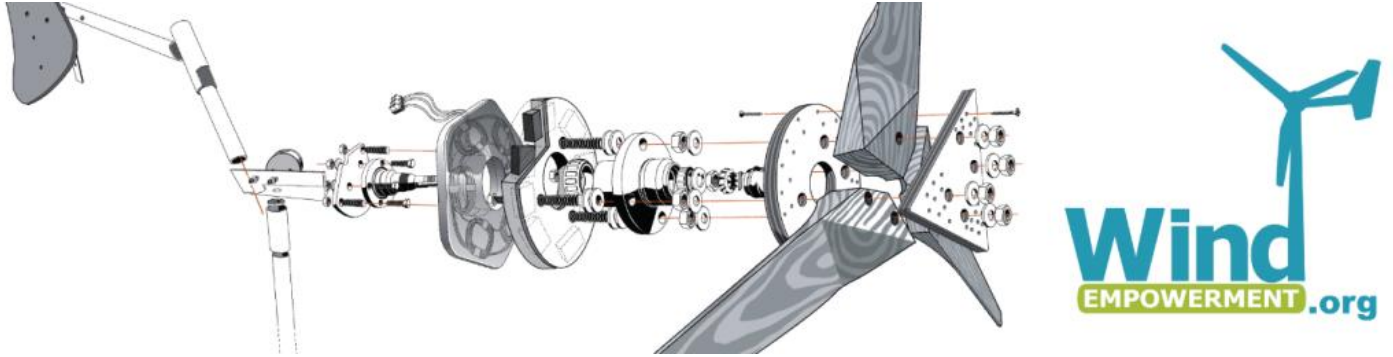
8.5   Appendix 4 – WEAthens2014 feedback form

What did you like most about WEAthens2014?

………
………
………

What did you dislike most about WEAthens2014?

………
………
………

Which collaborative activities do you plan to participate in with other Wind Empowerment members after WEAthens2014 has finished?

………
………
………

What else will you do differently in the future as a result of attending WEAthens2014?

………
………
………

Would you be interested in attending a similar event in 2 years' time? If so, why?

………
………
……….

What should we do differently if we were to run a similar event in 2 years' time?

………
………
………