

1. Title of the Action:

Capacity-building in South Africa, Namibia and Ghana to create sustainable, non-food bio-oil supply chains

2. Relevance of the Action

CO₂ emissions, and energy use and conservation, are matters of global concern.

In Europe, a market for carbon has been created in the form of the EU Emissions Trading Scheme (ETS) to help meet the EU's greenhouse gas emissions targets under the Kyoto Protocol. It has been in place since 2005 and is the first scheme of its kind in the world. The key areas for ensuring EU ETS meets its potential are setting safe, stable and affordable emissions limits; building a global carbon market; expanding the scheme, and improving efficiency.

Biofuels hold the capacity to meet energy demand with a low/zero carbon footprint. Biofuels are still the only renewable energy technology that actually sucks CO₂ out of the atmosphere via photosynthesis.

Furthermore, liquid biofuels will drive CHP engines to deliver energy with high efficiency (38% electricity, 42% heat) and, at the G8 summit of July 2007, a significant increase in the share of electricity offered by CHP was recommended.

In Africa, CHP installations running on biofuels would be of tremendous value because they could deliver electricity to small rural communities for which connection via the grid is too costly. Using locally-sourced bio-oil they would also be able to provide energy with an optimal carbon footprint with least energy losses. They would target poverty eradication at the small-scale farmer level, increase living standards, lower fossil fuel use and improve the ecological footprint of energy production. Furthermore since African countries hold the potential to produce biofuels at a far greater rate than Europe by virtue of favourable climatic conditions, and for oil-seed plants, land availability, sales of biofuels could be linked to global market demand and carbon trading schemes.

However the necessary biofuel supply chains are in their infancy.

This Action is aimed at EU and African partners jointly collaborating on a project to deliver sustainable non-food renewable biofuel supply chains, destined in the first instance for CHP electricity, and in the longer term, a renewable chemical feedstock linked to low/zero CO₂ emissions. The benefits will be income generation for rural African farming communities linked to the global demand for sustainable, 2nd generation non-food biofuels. However to achieve this goal will require a number of underpinning measures to be taken:

- It will be necessary to build capacity in the African scientific research and technology base to support joint EU-ACP projects aimed at increasing the yields of bio-oil from 2nd generation non-food sources such as jatropha or microalgae.
- It will be necessary to develop new biofuel skills training programmes for new oil-processing businesses and for ESCOs for the mutual benefit of both EU and ACP countries.
- It will be necessary to stimulate investment in new biofuel industries to deliver sustainable CHP electricity based on renewable biofuel.
- It will be necessary to link representatives of the farming and aquaculture communities in Africa with the biofuel business demand both in Africa and Europe.
- It will be necessary to promote the benefits of CHP systems running on biofuels and stimulate demand by the final beneficiaries, the municipalities, local and regional authorities who have the remit to procure energy for their communities. They are in general unaware of its availability and of the fact that it will reduce costs and CO₂ emissions.

In summary, this action will support South Africa, Namibia and Ghana in formulating science and technology policies to support the sustainable development of a renewable bio-oil-based industry providing electricity and in the future, chemical feedstocks as fossil-fuel replacements. It will create a framework for inter-regional co-operation in the field of science and technology, facilitate the acquisition and application of knowledge in bio-oil/bio-mass technologies, and build science and technology capacity in Africa by linking with networks of European counterparts (e.g. COST). It will increase opportunities for sustainable trade and reduce poverty through economic growth based on biofuels, and in so doing, assist in the progressive integration of African nations in the world economy.

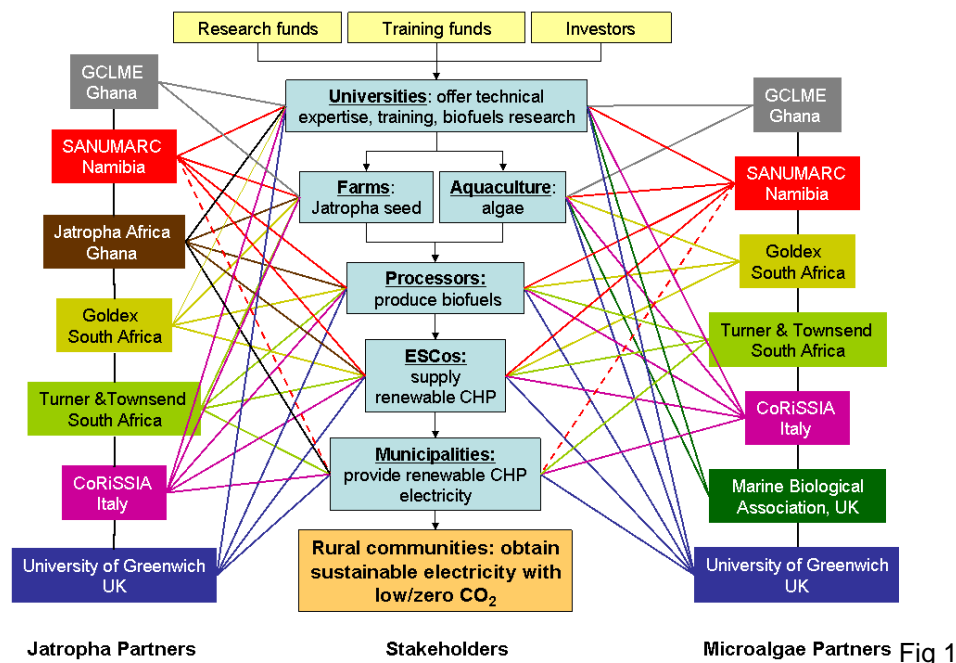
3. Description of the Action and its effectiveness

The overall objective of the Action is to build sustainable non-food renewable bio-oil supply chains for providing CHP electricity, and in the future, the chemical feedstocks needed to replace fossil fuels, by linking the relevant science and technology academics, professionals, decision-makers and support scheme managers from South Africa, Namibia, Ghana, Italy and the UK in a series of 9 inter-regional and intra-regional workshops over a 36m time-frame.

The timeframe will allow the following specific objectives to be achieved within an uncertain global framework regarding oil prices, rising CO₂ emissions, and growing prosperity and increasing urbanisation, especially in India and China:

- To build capacity in the research institutes and universities of Partner countries to draft research proposals that will support the objective e.g. develop the supply of sustainable bio-oil from 2nd generation oil-bearing plants (jatropha, salicornia) and from microalgae; develop new products with high value.
 - o Output: 6 quality research proposals offered for funding.
- To build capacity in the research institutes and universities of Partner countries to develop relevant training programmes to support the overall objective e.g. training for staff in ESCOs offering biofuel CHP / training for staff in plant processing businesses that are extracting oil from seed or microalgae.
 - o Output: 6 biofuel training programmes offered by African universities to train up a new workforce fit for purpose in an emerging biofuels industry.
- To stimulate investment in new biofuel businesses e.g. ESCOs seeking to supply renewable CHP electricity; plant processors extracting oil from seed and microalgae.
 - o Output: Attraction of investment into new biofuel businesses to support the creation of 3 new biofuel businesses.
- To foster partnerships between renewable bioenergy businesses and farming / aquaculture supply chains.
 - o Output: 3 new contracts between biofuel businesses and farming / aquaculture suppliers
- To promote success stories and best practices in businesses, commercial buildings, etc. and the public sector on the effects of taking up biofuel technologies e.g. installing renewable CHP systems for electricity, so that more actors become engaged with the need for low /zero CO₂ emissions in energy generation.
 - o Outputs: Appropriately targeted activities developed; 3 promotional activities delivered, 30 stakeholder target groups reached; 1 report on green credentials sent to stakeholder group; 6 renewable CHP systems planned.

The Partners for the Action are representatives of Industry and Academia, and between them, have links to all the necessary target stakeholder groups in each country (fig 1).



A situation analysis conducted by the lead partner in face-to-face meetings with representatives from each Partner country suggested that the most effective route for achieving the outputs of the Action centred on a series of 3-day workshops for different stakeholder groups: these groups would be targeted specifically from adoption of the Intensive Stakeholder Management system facilitated by Turner & Townsend for the Partners.

Stakeholders will be drawn from the following sectors

- Science and technology academics drawn from aquaculture and oil-seed biofuel research communities, and support scheme managers.

- Representatives from university biofuel business training communities
- Representatives from the investment community, who would also represent the targets for dissemination of success stories.
- Professionals and decision-makers from South Africa, Namibia, and Ghana with their European counterparts in Italy, the UK, and the EC.
- Partners to draw together success stories, identify key stakeholders, establish the most appropriate methods for communication with them, then develop the plan to deliver the promotion objective within the allocated budget

Stakeholders for the workshops will be grouped into one or more of 3 Working Groups according to their expertise and interests:

Working Group 1: Biofuel-driven CHP engines

Working Group 2: Jatropha as a source of non-food oil and biopharmaceutics

Working Group 3: Microalgae as a source of non-food oil and biopharmaceutics

Two workshops in each ACP country, a kick-off workshop in South Africa, mid-term review workshop in Italy and a concluding workshop in the UK (fig 2) will be overseen by a management committee for the Action, comprised of members from each Partner organisation.

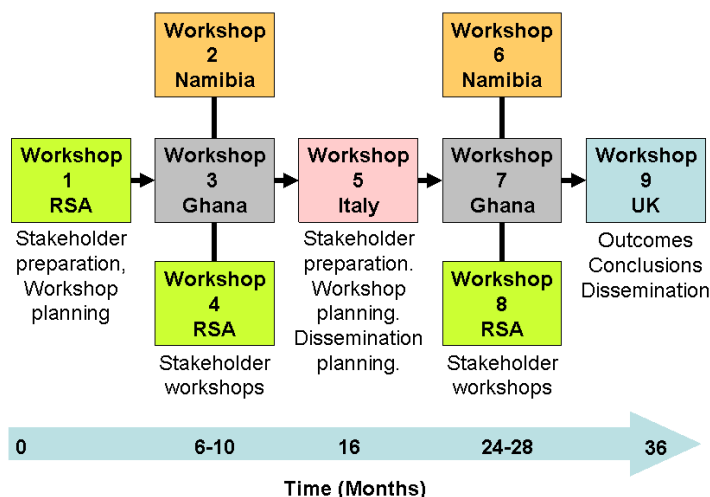


Fig 2

Delivering the outputs of the Action will be the responsibility of all Partners, and achieved by means of 8 Work packages (fig 3) together with a management work package.

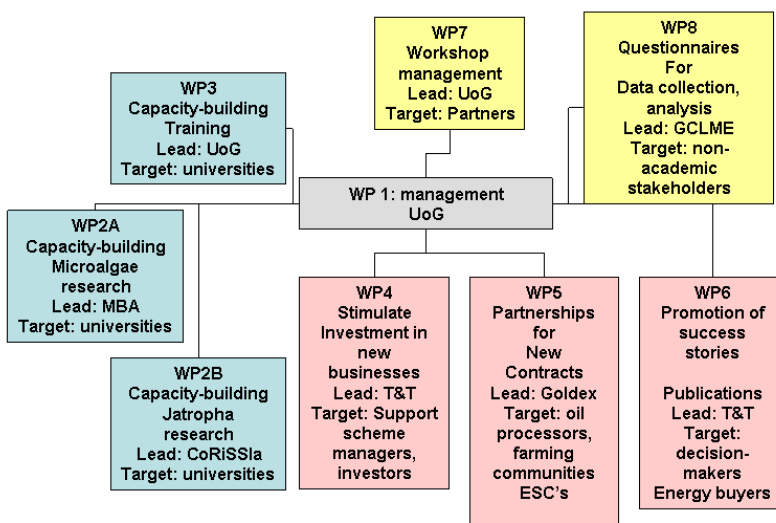


Fig 3

4. Sustainability of the Action

Objective	Risk	level	Mitigation steps
Build a sustainable non-food renewable bio-oil supply chains for CHP electricity, and future chemical feedstocks	Bio-oil costs exceed the price of fossil-derived oil	High	Promote green credentials of bio-oil - Seek green oil energy markets in a global market place - Engage with carbon trading schemes aimed at reducing the carbon footprint of participating countries
Build capacity in the research institutes and universities of Partner countries	Pro-active staff in Partner organisations no longer in post	Low	Foster relations with further stakeholders in partner country - Develop research proposals by European partners that will employ staff for African organisations - Seek scholarships for African partners
Build training capacity in for an emerging biofuel supply chain delivering oil for CHP electricity	Pro-active staff in Partner organisations no longer in post	Low	Foster relations with further stakeholders in partner country -develop further training programmes in alternative African partner organisations - Consider developing programmes that could form the basis of a spin-out training business
Stimulate investment in new biofuel businesses	Investment community uninterested	Low	Promote success stories - Increase effort on promotional activities - Increase size of target group invited to the next workshops
	No interest to create biofuel businesses	Low	Promote success stories - Increase effort on promotional activities - Increase size of target group invited to the next workshop series
Foster partnerships between renewable bioenergy businesses and farming / aquaculture supply chains;	No interest between stakeholder groups to engage	Low	Promote success stories - Increase effort on promotional activities - Increase size of target group invited to next workshop series - Change workshop format to stimulate better quality engagement between attendees - Strengthen the knowledge of farming professional organisations on international markets via links with European equivalent organisations
Promote success stories and best practices	No success stories to report on from Africa	Med	Promote success stories that already exist in Europe - Increase effort in promotional activities
	Green credentials report suggests unforeseen negative impacts on the environment	Low	Review report data in light of European findings and vice versa - Increase focus of effort to understand the reasons for the negative impacts - Develop findings for a publication - Use the data as the basis for a research training programme - concentrate building capacity in areas that will lead to increased yields of oil/biomass /alternative plant forms

Provided that the main objective has been attained, the risk that the project fails to sustain itself financially is very small: there is likely to be increased demand, hence income, for training and for research for further high-yielding oil plant sources with valuable by-products in response to the global demand to reduce CO₂ emissions from a fossil fuel-based chemical industry sector.

The strapping together of supplies of renewable oil in Africa with global demand for renewable “green” oil should generate substantial income for the rural poor in Africa, provided they do not have to compete with unfavourable subsidies in other countries.

The development of a strong biofuel supply chain will support demand for further bio-oil-based developments and maintain the profitability of emerging new biofuel businesses. The overall increase in bio-fuel activity should sustain initial investment to grow capacity in the area to meet a pressing need to reduce CO₂ emissions and identify renewable alternatives to fossil fuels.