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**An Evaluation of European Strategies to Involve the Private
Sector in Energy Projects in Africa**

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Abstract

There is a need for better access to energy services and more efficient and reliable energy supply especially in rural Africa where mostly biomass (in the form of firewood) is used as a source of energy – leading to problems like indoor air pollution. As a result of economic growth and the upgrading of economic activities the energy demand is rising, making energy a constraining factor in the development process. Africa is currently facing an energy crisis. GDP growth has been lowered in some countries like Tanzania as a result of severe shortages.

The need to improve access to energy services in African countries in order to achieve the Millennium Development Goals and improve the lives of poor people has been acknowledged by recent European initiatives such as the European Union Energy Initiative and the Africa-Europe Energy Forum, the Africa-EU Energy Partnership, the ACP-EU Energy Facility and the EU Africa Partnership on Infrastructure. "[A]chieving access to secure, reliable, affordable, climate friendly and sustainable energy services for both the EU and Africa through the launch of a comprehensive Africa-EU Energy Partnership" (final outline, p. 9) has become part of the Joint EU-Africa Strategy. Besides, energy has been a priority issue at the World Summit on Sustainable Development (WSSD) in Johannesburg 2002, during meetings of the Commission on Sustainable Development (CSD) and climate change policy negotiations, where the European Union is a major actor.

In all these contexts, it is repeated again and again that without private sector involvement the political goals with regard to energy services cannot be reached. There is a change in donor policies in the direction of more private sector involvement and leveraging private capital.

The outline of the paper is as follows:

First, an overview of the links between energy and development and of the current demands on the African continent is given.

Second, investment decisions are analyzed from a private investors' perspective. Two problems arise here: Most (renewable) energy projects are characterized by (a) high risks/ uncertainties – and (b) low returns, if it comes to the supply for poor people. Thus, there is a need for risk management instruments and better regulatory frameworks, if these private initiatives are to become more than grants/ gifts under the headline of "corporate social responsibility" or forever highly subsidized projects. Nevertheless, if poorer people are the target population, direct or indirect public sup-

port to leverage returns on investment for private actors such as energy companies or green funds will be inevitable.

Third, European initiatives in this field are evaluated against this background. Potentials and limits of PPPs or "strategic partnerships" are critically assessed. The necessity of coordination and pulling funds together – as done with the EU Infrastructure Fund for Africa – as well as harmonizing bilateral donor policies in the energy sector is stressed.

1. Energy and development in Africa

Energy services have not been included into the Millennium Development Goals (MDGs) framework as a separate target. Nevertheless, energy delivery is part of the essential infrastructure needed for a productive life and to reach the goals and targets set by the General Assembly of the United Nations (UN) in 2000. Despite of its abundant energy resources, consumption of modern energy in Sub-Saharan Africa (SSA) is the lowest in the world. Especially in rural areas a vast majority of the people has no access to electricity. Moreover, in some countries more than 90% of the energy consumed is produced from biomass, i.e. fuel-wood, charcoal, and dung. Open fires and unprocessed fuel contribute to emissions and indoor air pollution that are responsible for respiratory illnesses (UN Millennium Project 2004: 29; Karekezi/Kimani/Wambile 2007: 1f.).

The way energy is produced and access to energy are not only important for health-care, but also for education, communication, and lighting, just to name a few. Energy services have a high marginal value for economic growth and development and are economically costly in many parts of the developing world. Moreover, there are important links between energy services and environmental issues (Barnes/Toman 2006: 245). Modern forms of energy can improve productivity, especially in rural areas, and enable income generation at the local level. Additional opportunities for employment may be created, thereby diversifying the income sources available (Modi et al. 2006: 17).¹ Renewable energy technologies (RETs) can also spur the creation of micro-enterprises. On the other hand, one must caution against too high expectations: The economic benefits that can be generated also depend on other conditions. Therefore, improvements in energy delivery must be accompanied by complementary actions and integrated into a poverty alleviation strategy encompassing more than (rural) electrification alone (Barnes/Toman 2006: 252; Martinot et al. 2002: 326f.).

Though not sufficient, the improvement of access to energy is an essential and necessary input if the MDGs are to be fulfilled in African countries. SSA is still way off the track to meet the MDGs (UN Millennium Project 2005: 19). Energy crises in countries such as Tanzania show that energy shortages are a bottleneck to economic growth

¹ For a more in-depth analysis of the linkages between energy services and development see Barnes/Toman (2006), DfID (2002) or Modi et al. (2006) and the literature cited therein.

and development. The challenge here is to increase funding for energy access which has to be doubled at least, while private funding has declined and is on a low level in African RET markets.²

Switching from traditional biomass to kerosene or gas as suggested by the UN Millennium Project (2004) may be a first step but increases the dependence on fossil fuels. And rising oil prices have a negative effect on economies of oil importers and force the poor to go back down the energy ladder (UNDP 2005). This is why the focus will be mainly on renewable energies in this paper. Besides, grid extension is not a feasible solution for many rural areas, where RETs sometimes are the only economically viable way to electrification or other energy services. There is a wide range of different RET project types: From large-scale projects like the Inga dam in the Democratic Republic of Congo or transboundary grid routes through Africa, over medium-scale hydro, wind parks, geothermal power, biomass or concentrating solar power, all integrated into the national grid, to rural off-grid centers, household scale appliances, or sustainable household biomass (e.g. improved stoves).³

Sources for funding and technical assistance comprise public as well as private actors on various levels: Global, continental, regional and national. The following section deals with different private actors and their investment decisions. The problems of RET projects in Africa are described and possible public actions to solve these problems are briefly discussed. These theoretical considerations serve as a background for the assessment of European initiatives of financing for (renewable) energy on the African continent in the third section of this paper. Since it is often stressed that investment needs can never be met without private sector participation, potentials and limits of Public Private Partnerships (PPP) or other forms of cooperation between public and private actors are examined. Moreover, the need for (more) coordination and harmonization among donors is stressed, not only within the European Union (EU) and its various institutions, but also between EU and multilateral donors and networks. The paper ends with a short summary of results and conclusions.

² The World Bank estimates that there is a need of US-\$ 4b p.a. to increase access to electricity in SSA from 24% (2005) to 47% (2030). US-\$ 11b p.a. would be needed for 100% access; see World Bank (2006: 9f.). Actual investment in RET markets in Africa has been US-\$ 99m only and purely asset finance with no venture capital/private equity or public market investments; see Greenwood et al. (2007: 16).

³ For an overview of the renewable energy potential on the African continent see Karekezi/Kimani/Wambile (2007).

2. Private sector involvement

2.1. *Private sector contributions*

There are two fields within which private sector agents act: The first being the renewable energy industry (and related businesses), i.e. the more technical part, the second being the financial sector providing capital and risk management instruments for RET projects. Private agents may provide training, transfer of knowledge, (innovative) technical solutions or (help to) build capacity in the recipient country. On the technical side, there are energy companies and business associations. In the financial sector, important actors in this area besides banks are microfinance institutions, venture capital funds, carbon funds, and insurance companies.

Projects are mainly evaluated by looking at costs and benefits. Besides these financial motives other considerations may be important. With regard to "green funds" this might be sustainability or "corporate social responsibility" for example (Schaltegger/Figge 2000). There is a not-for-profit sector where these kinds of motives play a significant role. Nevertheless, the focus in this paper will be on the private, "commercial" sector and the possible collaboration between public and private sectors. Investment planning data always contain some degree of uncertainty⁴, which must be considered. There are three general possibilities for doing so:

1. The cash flows are adapted to incorporate these uncertainties (e.g. via simulation, to a certain extent also via sensitivity or scenario analysis).
2. A risk premium is added to the discount rate taken to calculate the Net Present Value (NPV). Capital market models might be used here.
3. The amortization period is shortened, i.e. the period of time after which upfront costs must have been paid back by revenues.

When choosing between different projects, private investors will not only take risks and returns of a single investment into consideration, but also the correlation among risks of different projects. In general, the higher the uncertainties are the higher must be the returns which are expected from an investment. Besides, assets which are not

⁴ Uncertainty is used here in a wider sense, comprising risk, where a probability can be assigned to possible outcomes, and uncertainty in a narrower sense or ambiguity, where such an assignment is not possible.

or even negatively correlated with other assets are of special interest, since portfolio diversification is possible here.⁵

As will be shown in the next section, the low level of private investment in RET projects in Africa is due to the fact that they offer "a low return with an extra portion of risk" (KfW/World Bank 2005: 5). High initial costs and accordingly a long amortization period, low returns and uncertain cash flows leading to high risk premiums result in a low NPV – which is the reason why most of the projects are "CSR driven" or donations instead of commercially viable businesses.⁶

2.2. Problems of RET projects in Africa

Barriers and uncertainties of RET projects can be lumped together into four groups:⁷ (1) supply side, (2) demand side, (3) framework conditions, and (4) financial sector.

▪ Supply side barriers

One barrier inherent to RETs is that because of the newer technologies and insufficient data for analysis operating uncertainties are higher.

Smaller project sizes tend to be too small for some financiers, which is especially the case with rural electrification. Also transaction costs per unit produced are much higher than.

Longer lead times and high upfront costs result in a higher ratio of capital costs to operating costs. Thus, there is a need for longer-term financing. Moreover, projects are exposed to uncertainties for a very long time, making them more sensitive to capital structure and especially political uncertainties.

Present technologies are not yet fully competitive.

Developers are mostly less experienced. Therefore, completion and operating uncertainties tend to be higher. The track record of developers is in most cases limited.

Moreover, developers mostly have a low level of own funds, i.e. few equity and no collateral as required by banks for corporate finance.

Commercialization and marketing are complicated by the relative novelty of technologies competing with mature ones.

Further, there is a lack of commercial business models and of local capacities to adapt technology.

⁵ See e.g. Ross/Westerfield/Jaffe (2005). Though you will find a more thorough discussion of investment decision making in the investment planning and portfolio selection literature, the basic outline given should be sufficient for the purposes here.

⁶ Estimation given in an expert interview.

⁷ The following is a summary of findings from KfW/World Bank (2005), Sonntag-O'Brien/Usher (2004), Davidson/Turkson (2001), and MIRREIA (2005).

Low accessibility due to difficult location aggravates the problems with the infrastructure to deliver services.

Other uncertainties include those commonly found in foreign projects such as currency uncertainties or credit, economic, and political uncertainties.

Fuel supply uncertainty is mainly caused by difficulties in assessment (e.g. wind, geothermal) or delivery (e.g. biomass). This type of uncertainty is usually understated for conventional power plants. Since there is no correlation between renewable energy and fossil fuel supply, RETs could be used as a natural hedge (Sonntag-O'Brian/Usher 2004: 7).

- ***Demand side barriers***

One barrier on the demand side is the lack of familiarity with RETs. Moreover, awareness and willingness are lowered by a limited cultural acceptance of RETs.

Problems regarding adequacy and costs lead to low rates of return, thus impeding investments in RET projects. Consumption levels in some areas are too low. Most of all, there is not enough productive use especially in remote rural regions. Thus, there is a need for developing businesses and upgrading before or together with the RET projects.

Ability-to-pay and willingness-to-pay are low especially in rural areas. High unit costs per consumer therefore further aggravate demand-side problems.

Third, there is often low demand from power grids for excess supply to be fed into the grid.

- ***Framework conditions***

Transmission access, interconnection, permitting, and liability requirements, siting restrictions or prohibitions to sell into the grid are all problems created by inadequate policy and legal frameworks.

Moreover, pricing rules play a significant role for energy investments. Tariffs are often too low for RETs to recapture costs. Price distortions such as subsidies or unequal tax burdens also favor conventional sources.

High political uncertainties and weak institutions may deter foreign investors.

Insufficient market performance is another barrier for RET projects where positive externalities of renewables are not valued and negative externalities are not internalized into prices of fossil fuels. This adversely affects commercial viability of RETs.

Structural transition of energy markets in African countries creates further uncertainty.

Inadequate information may lead to market failures as well as natural monopolies of infrastructures – thus the need for governmental regulation.

▪ ***Financial sector***

Financial sector barriers include problems with the acceptance of RETs by financiers. These types of projects are normally unfamiliar to banks or other intermediaries. Aversions to new things may further raise high risk perceptions.

Moreover, financiers have lost trust in energy projects in general due to incidents as the California energy crisis, the Enron debacle or blackouts in the USA and Europe.

Too small project sizes and high transaction costs per deal together as well as a risk-return profile considered not attractive compared to other types of projects hampers the willingness to finance RET projects.

All this leads to a lack of funds and/or financial instruments. Different RETs require different types of finance: Consumer finance and microfinance needed for off-grid and small size solutions are often absent in rural areas. Corporate finance for medium sized projects is difficult due to a lack of collateral and high interest rates. For projects of a large scale project finance could be used as financial tool, but is difficult as long as there are some risks which are not taken by any party or funds are lacking.

There are more traditional short-term solutions than creatively structured products.

Insurance premiums are (too) high if policies are available at all.

And mobilization of local investments tends to be low.

Taken together, these problems may create a vicious circle: Reluctance of financiers and manufacturers to invest and consequently low investment rates lead to low levels of production. For economies of scale to be realized higher production levels would be needed. High costs resulting from this further lower demand and therewith deteriorate investment conditions.

2.3. Public interventions and the possible role for ODA

There are some areas where public interventions might help to break this vicious circle: Policy environment, financial sector, pricing, additional revenue streams, and support for the productive sector which might raise the demand for energy. Improvements in the policy environment have been taking place with liberalization in many energy markets. Nevertheless, most energy markets are in still in transition. Energy market regulation is a complex task. A major role for ODA thus is policy advice.

Helping to close funding gaps for infrastructure is another one. Donors could provide equity, especially for financing during the seed stage. Public participation in venture capital funds might help to raise funds also for Africa. Debt finance or grants for larger or medium-sized projects is needed as well as the development and support of risk management tools. Training and awareness raising is also necessary in the microfinance sector, although this should be limited to initial stages in order to prevent crowding out of private initiatives by public funds.⁸

Some developed countries have made experiences with price-support schemes or fixed-price schemes for renewables, which make revenues more predictable and stable, thereby reducing risk premiums and making RET projects economically viable. These instruments, experiences with them, and possible supporting ODA schemes should be analysed.

Additional revenue streams could be generated for renewable energy projects through the Clean Development Mechanism (CDM) of the Kyoto protocol. Another financial tool to be explained in section 3.6 are Tradable Renewable Certificates (TRCs).

3. An assessment of European initiatives

3.1. *Africa Strategy and energy agenda*

In this section different European initiatives and their possible impact are assessed vis-à-vis theoretical considerations in the previous section. It is investigated which barriers for renewable energy projects are addressed, what kind of instruments are used, how these initiatives are linked to other actions by multilateral or bilateral donors and what effect they may have on private RET investments.

The first part will deal with the overall policy framework towards Africa. The Africa Strategy of 2005⁹ and the 2007 Joint Africa-EU Strategy¹⁰ can be seen as striving towards coherence in the various policy fields. Energy is set therein as a key development issue and also mentioned as part of the infrastructure challenge and climate change policy. Both strategies address the whole continent, with the African Union (AU) as the partner.

⁸ For the problem of crowding out in the microfinance sector see Dieckmann (2007: 13).

⁹ See COM(2005) 489 final.

¹⁰ See Portuguese Presidency of the European Union 2007.

Nevertheless, different institutional arrangements remain for North Africa, SSA, and South Africa. As part of the Barcelona Process the Euro-Mediterranean Partnership has been created. The European Neighbourhood Policy (ENP) also addresses North Africa, with the European Neighbourhood Policy Instrument (ENPI) as source of funding. SSA is part of the Africa, Caribbean, and Pacific (ACP) group with the European Development Fund (EDF) as main financial instrument. South Africa has its own Trade, Development and Cooperation Agreement (TDCA) with the European Communities and is specifically addressed as geographical area within the Development Cooperation Instrument (DCI).

These different institutional arrangements must be taken into consideration when analyzing the European energy policy towards Africa. The second point to be made is that there is not only one topic on the energy agenda. Having shown some linkages between access to energy and development, the latter together with the MDGs as catalogue of goals and specific targets to be achieved is one obvious candidate. Climate change policy is another topic currently high on the political agenda. Questions related to this field will be dealt with below.

The third topic on the agenda is geopolitics and energy security. Acknowledging Europe's dependency on energy imports which will become even greater in the future and because of rising prices for fossil fuels with a revived interest in geopolitics, there is the attempt to build up a coherent common external energy policy for the EU. Concrete actions, as laid down in the Commission's Green Paper on Energy Security¹¹ and subsequent documents and communications, are the integration of Maghreb countries into the EU electricity internal market and negotiations of a Euro-Maghreb Energy Community Treaty. Transit from SSA is included as a later step. SSA is mainly seen as a market for fuels of growing importance where China's rising influence becomes visible.¹² Development issues are not more than a minor point, showing that the integration of development and energy policies is at least on an initial stage.¹³

Different institutional arrangements according to parts of the continent as well as energy related topics are mirrored by competencies within the Commission, which are spread over various departments (Department General, DG): Development for ACP

¹¹ See COM(2006) 105 final.

¹² See SEC(2006) 317/2: 40f.

¹³ The need for an integration is acknowledged in COM(2007) 1: 19.

countries and DCI, External Relations for ENP, Environment for climate change policy, Energy and Transport for energy policy in general and research in this field.

Thus, institutional diversity makes policy coherence difficult, despite the various attempts to integrate different policies and into a common framework as with the Africa strategies or the Green Paper in the area of energy policy. Integration into a coherent European energy policy towards Africa and its different regions is still a task to be fulfilled.

3.2. *Institutional diversity and the Energy Partnership*

Similar conclusions can be drawn with regard to the WSSD process. As a result of the conference a Johannesburg Plan of Implementation (JPOI) was launched with the possibility of associations of various actors in different fields to be registered as so-called type 2 partnerships. Some existing, but also many new initiatives have been registered since 2002. Organizations comprise agents from the public as well as the private sector and civil society. Among this multitude of networks are the Johannesburg Renewable Energy Coalition (JREC)¹⁴ and the European Union Energy Initiative (EUEI)¹⁵ for poverty eradication and sustainable development.

The EUEI was launched at the WSSD together with an Energy Facility to promote energy projects in developing countries. "Intelligent Energy – COOPENER" as part of DG Energy and Transport's "Intelligent Energy-Europe" program has been funded via this facility. The program is now substituted by the DCI's Thematic Programme for Environment and Sustainable Management of Natural Resources, including Energy (ENTRP).¹⁶

Other activities financed and coordinated through EUEI were/are dialogue events and the Partnership Dialogue Facility (PDF), managed by the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ). The PDF aims at integrating energy access into national and regional policy, capacity building, and dialogue with all relevant stakeholders, including regional organizations.

Thus, EUEI mainly works as a coordination platform for energy and development related activities by the EU and its member states, e.g. in the UN Commission on Sustainable Development (CSD) dialogue. This can be seen as a good step in the right direction for more policy coherence. EUEI specifically addresses the regulatory and

¹⁴ See JREC websites.

¹⁵ See EUEI websites.

¹⁶ See Commission Decision of 20 June 2007.

policy framework and promotes the use of RETs. The Africa-EU Energy Partnership launched at the Lisbon summit in December 2007 can be seen as a reinforcement of EUEI focussing on the African continent.¹⁷

On the other hand, coordinating activities of the various JPOI type 2 partnerships which serve similar interests, but are built by different public and private actors, seems to be nearly impossible.¹⁸ EU member states and implementing agencies participate in different networks and still have their own bilateral programs. While according to the volume of ODA the European Communities and Germany are the leading donors with regard to energy projects, the only donor that provided equity for RETs projects has been the United Kingdom (Aalst/Baartman/Castro 2003: 45). Whereas in some countries like the Senegal there is a coordination of donors responsible for certain rural areas,¹⁹ in other countries like Tanzania there is a highly fragmented market and donors have attached only small financing components to their technical assistance, which does not make funding RETs projects in rural areas with an at least weak microfinance sector easier.²⁰

The EUEI and the Energy Partnership are therefore one step in the direction of a more coherent policy. Nevertheless, more attention is to be paid to cross-sector linkages such as energy and microfinance or business development. Moreover, the relation between the European policy frameworks and institutions mentioned, bilateral programs of member states, and international fora like the JPOI type 2 partnerships with member state and EU participation or the Infrastructure Consortium for Africa (ICA)²¹, founded in 2005, must be clarified.

3.3. Addressing investment needs – European funds

Beside EUEI and the Energy Facility, there are a number of other European funds available for RET projects which will shortly be described in this section. The Commission, member states, and the European Investment Bank (EIB) have set up the Africa-Europe Partnership on Infrastructure together with the Infrastructure Trust Fund (ITF).²² The ITF supports cross-border infrastructure projects, including energy,

¹⁷ See COM, DG Development 2007.

¹⁸ A search in the partnership databank gave the number of 93 energy-related partnerships; see websites of CSD Partnerships Database. While some networks are mentioned as partners for dialogue on the EUEI websites, many others where EU member states participate are not.

¹⁹ Expert interview.

²⁰ Personal communication with Stefan Henkelmann, Savings Banks Foundation for International Cooperation.

²¹ See ICA websites.

²² See Partnership and ITF websites.

with public or private partners. It can be used as source of co-finance and provides funding for interest rate subsidies, technical assistance/feasibility studies, environmental or social project components, early-stage finance and risk mitigation insurance premiums. EIB manages the fund. € 146m have been committed so far.

The 10th EDF²³ (2008-2013) makes financing available for ACP countries under the Revised Cotonou Agreement. If countries have included energy into their programming documents also RETs projects can be funded. There is more emphasis on regional integration with the 10th EDF. In total € 21,966m are allocated to ACP countries. North African countries have no access to these funds. Instead the ENPI can be used for support.

There is an ACP-EC Energy Facility²⁴ financed from intra-ACP funds. € 220m can be used for co-financing of projects.

Besides, the EIB has also own resources for renewable energy projects.²⁵ Loans and guarantees are provided for economically viable projects with mature technologies. The EIB works together with other donors in consortia. And there are a number of new flexible financing mechanisms such as the Risk Sharing Finance Facility (RSFF) used to lend for research and development in energy among others.

Thus, ITF, ACP-EC Energy Facility, but also EDF and the EIB with its "standard" programs mainly address the financial barriers for RETs projects, mostly via co-financing for large-scale and transboundary projects where private partners may be involved, but often play a minor role. Technology development is financially supported by the EIB. Exchange of best practices also takes place on dialogue events organized within the EUEI. The political and regulatory framework is addressed with the dialogues as well.

Whereas some of the barriers describe in section 2 are lowered by these funds and programs, some problems still remain: Only few initiatives tackle the barriers for small projects or demand side problems. Integration of energy, microfinance, and private sector development is not discernible. Since funds for small projects are lacking, revenues are uncertain and returns are low, private participation in rural energy projects is unlikely even though improvements in the policy environment may definitely be helpful. With regard to large-scale projects and overall investment needs, the amounts provided are still not sufficient to reach the targets set.

²³ See EDF websites.

²⁴ See ACP-EC Energy Facility websites.

²⁵ See EIB websites.

3.4. *Multilateral aid outside the EU*

In order to pool funds and create a coordinating platform the World Bank has developed a syndication approach with the African government as syndication sponsor and a donor as lead syndicator. Form of participation and the amount of financial commitment can vary according to donor interests. Nevertheless, with this approach the donor community moves away from ad hoc donor-by-donor and project-by-project decision making. Prospectuses will be developed for Senegal and Zambia first (ESMAP n.d. a, b).

The German EU presidency together with the Commission (2007: 5) acknowledged that more coordination is needed with the World Bank's "Clean Energy and Development: Towards an Investment Framework" and "Energy Access Action Plan for Africa". Other multilateral agents such as UN funds and programs could be named as well. One solution could be to coordinate participation in the platforms provided by the World Bank via the EUEI. This would entail arrangements among EU level initiatives and member state bilateral programs.

Since problems with rural energy projects are widely acknowledged, further coordination on an international level is needed as well with regard to emerging rural electrification programs. In Tanzania, for instance, the World Bank supports the Rural Energy Fund (REF) and priority projects under the Energizing Rural Transformation (ERT) program (MIRREIA 2005: 18). The support comprises co-financing grants to RET-entrepreneurs as smart subsidy²⁶, technical assistance, negotiations of power purchase agreements with the grid possessing company, and seed finance for micro, small, and medium RET-enterprises. These problems are only partly addressed by EC and/or bilateral donors, mostly at a project-by-project basis.

3.5. *Innovative financing mechanisms: GEEREF*

Similar tools will be provided by the Global Energy Efficiency and Renewable Energy Fund (GEEREF), created by DG Development under the ENTRP.²⁷ Under JREC's Patient Capital Initiative the EUEI Finance Working Group has discussed possibilities to close the funding gap for smaller projects, resulting in a feasibility study for a fund-of-funds. Expertise has been brought in by EIB, the Kreditanstalt für Wiederaufbau (KfW), UNDP and the International Finance Corporation (IFC). The fund management is led by Triodos Fund Management b.v. Initial funding target are € 100m. €80m

²⁶ Smart subsidy means that the grant is output-based, see Martinot et al. (2002: 331).

²⁷ See GEEREF websites.

are pledged by EC for four years. It is estimated that up to €1b of additional risk capital can be attracted. 10% of total fund size will be used for technical assistance in order to reduce transaction costs by improving project proposals and business plans. This shall lead to higher fund performance.

GEEREF is a fund-of-funds with regional sub-funds to be founded in ACP, North Africa, Latin America, Asia and non-EU East European countries. Target investments are a wide range of different projects below € 10m with a proven technical track record: Utility-based projects, manufacturing and assembly businesses, consumers, small and medium-sized enterprises and microfinance intermediaries. The funds will provide equity, i.e. "patient risk capital".

The historical development of this instrument may be taken as a successful example of coordination in the energy and development policy towards developing countries. If the geographical scope of sub-funds will be according to the usual divisions has yet to be determined. Even if € 80m for the whole developing world might sound rather low, there are pledges by other donors who have already signalled their interest. If this fund works well there might also be more initiatives in the same direction.

With this fund there will be a wide range of PPP possibilities on different levels: Private investors might join the fund-of-funds which diversifies risks geographically and over more projects than the single sub-funds. If first stages of the businesses are funded to a larger extent by public sources, other private investors might join at later stages with a shorter time of exposure to risk, lower/less uncertainties, and thus a shorter amortization period. The technical assistance facility lowers transaction costs, helping to make projects commercially viable. The equity provided assists in finding other sources of finance such as bank loans, especially at later stages.

GEEREF therefore complements the other tools described above. These will be most effective if different measures work hand in hand: Improvements in the policy and regulatory framework which can be regarded as precondition for private initiatives to take place; business model development as well as funding research and development done by the EIB and EC; improvements in the infrastructure, coordinated on an international level. Nevertheless, one problem remains widely unsolved: The demand side barriers.

3.6. *Climate change policy and other sources for revenue*

As listed in section 2.3, carbon finance on the one hand and TRCs on the other hand could function as additional revenue stream for RET projects. From an investor per-

spective more or less certain revenues would help to make projects attractive. Since both instruments, carbon finance as well as TRCs, are still young and the future development highly dependent on international political decisions, this condition is difficult to be met.

Nevertheless, carbon finance is used as instrument for RETs projects in most regions of the developing world – with the Africa having only a very small share in the carbon market (Capoor/Ambrosi 2007: 24). Emissions reducing projects can be used to generate Certified Emissions Reduction (CER) certificates, which can be traded. Projects must be approved by the CDM Executive Board.

Problems associated with CDM projects are the high transaction costs and uncertainties with regard to approval. Some of the problems with CDM rules for small projects might be overcome with the possibility of bundling of projects and the so-called "programmatic CDM" (Carbon Finance Unit 2007: 18). This is one way how climate change policy affects energy markets.

Promotion of CDM in Africa is included in the EUEI. Nevertheless, Africa has played only a minor role on the Conference of Parties in Bali in December 2007 (Unmüßig/Cramer 2008). Besides capacity building in African countries and starting pilot projects to show successful examples, there is a need for lowering transaction costs, uncertainties with regard to regulation, and further improving possibilities of bundling smaller projects. These regulatory issues are daily business in the field of climate change policy with impacts on development and energy policy. Beside capacity and awareness building, lowering uncertainties is a main barrier for wider use of the CDM in RETs projects in Africa.

TRCs, also called green tags, green certificates or renewable energy credits are discussed as a tool to integrate the private sector e.g. in the Mediterranean Renewable Energy Partnership (MEDREP), launched by Italy and established as a JPOI type 2 partnership.²⁸ TRCs use an unbundling strategy to sell non-energy attributes of electricity produced from renewable sources. These certificates can be bought by residential or non-residential customers who value "green" electricity higher than conventional production. The revenues generated by selling the certificates can be used to finance the RETs projects (Fitzgerald et al. 2003: 3f.).

²⁸ See MEDREP websites.

Using TRCs will require standardization and verification procedures. Moreover, it would make sense to test this instrument for North African markets if these are integrated into the EU energy internal market.

4. "From donor aid to sustainable markets"?²⁹

European initiatives to support RETs projects in African countries or developing countries in general are addressing a wide range of barriers which prevent the development and adequate functioning of markets: Technical assistance and dialogue to improve the policy and regulatory framework, financial instruments to overcome supply side barriers and the low level of available funds. Moreover, the GEEREF will provide equity needed in small-scale projects, especially in rural areas. Participation in the syndication approach is a further step away from project-by-project approaches. Although there is a need for further developing coordination platforms and arrangements of donors and clarifying the status and relation among networks, the EUEI provides a forum which can be used to harmonize European policies in this field. The relation among climate change policy, development policy and energy issues, and geopolitics and energy security needs some clarifications. And instruments to tackle demand side barriers will have to be further developed. CDM and TRCs may lower some of these barriers, but will certainly not play a major role for smaller-sized projects unless regulations are improved.

Steps in the direction of a more coherent policy away from donations could be improved if other fields such as microfinance and private sector development are integrated. More of funds in the line of GEEREF could help to address the financing problems. By supporting early stages of businesses sustainable markets could be developed.

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