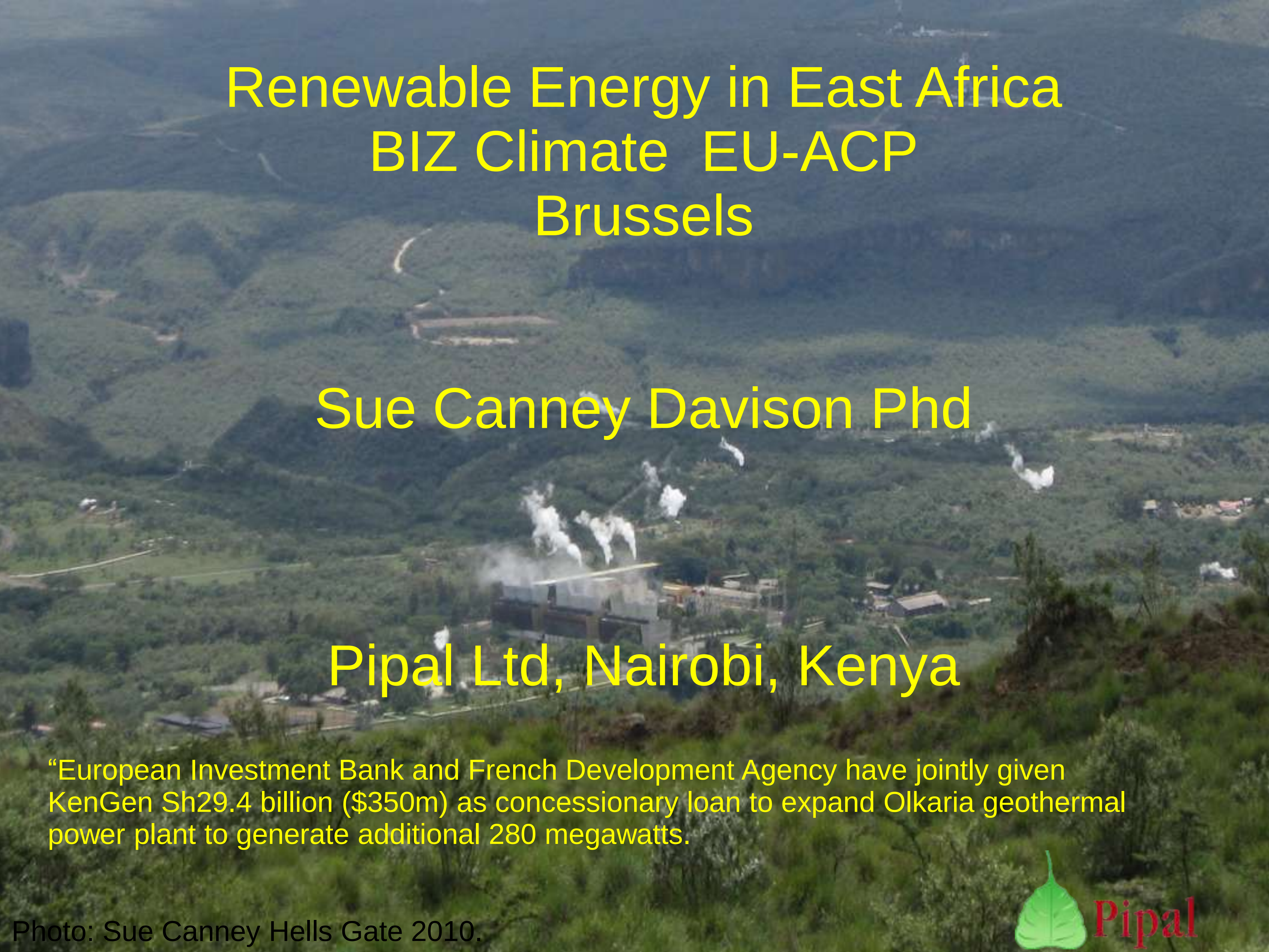

Renewable Energy in East Africa
BIZ Climate EU-ACP
Brussels

Sue Canney Davison Phd

Pipal Ltd, Nairobi, Kenya

“European Investment Bank and French Development Agency have jointly given KenGen Sh29.4 billion ($350m) as concessionary loan to expand Olkaria geothermal power plant to generate additional 280 megawatts.

Photo: Sue Canney Hells Gate 2010.

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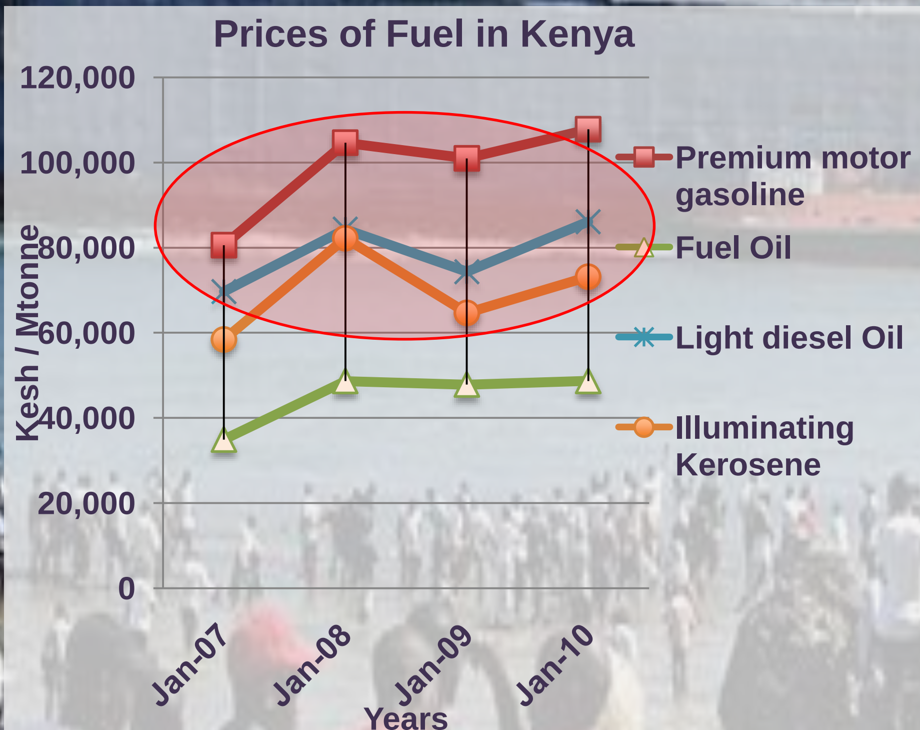
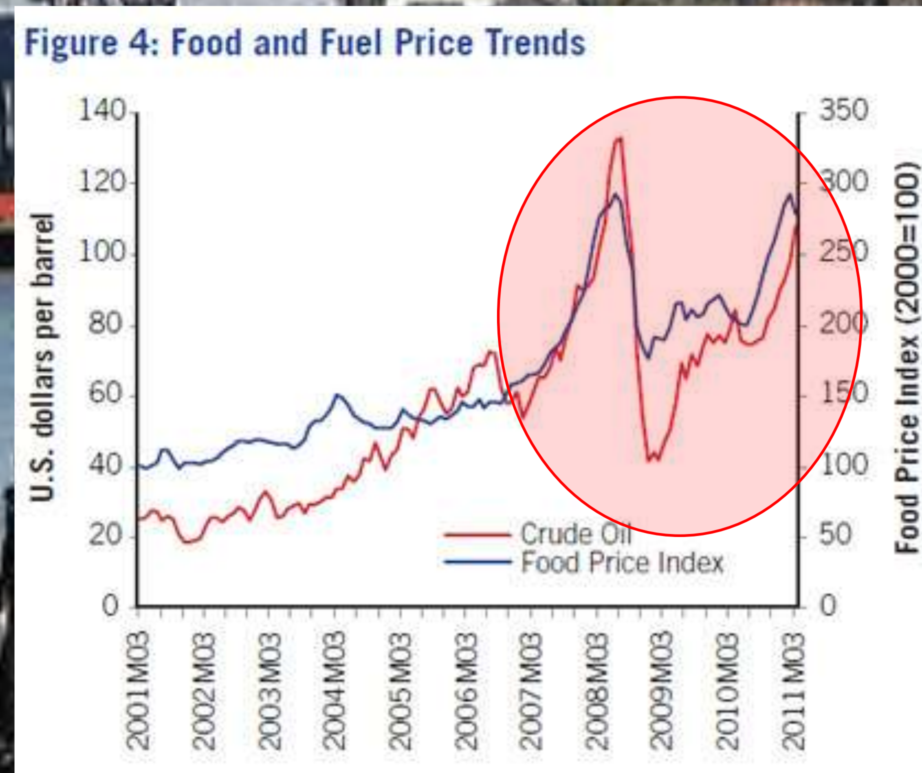
Kenya: Once fuel prices rose, they have stayed higher than global prices fluctuations.





Source: Adapted from DECPG data. Food price watch World Bank.

Ransomed and released

Photo: Anthony Njuguna Reuters.

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WHY IS RENEWABLE ENERGY SO IMPORTANT IN EAST AFRICA?

- Import fossil fuels- foreign exchange–volatile exchange rates with Ugandan Oil and Tanzanian Gas coming on line.
- Electricity for lighting and manufacturing is already dependent on hydro, geothermal, wood and other biomass. Emergency diesel is highly expensive and inefficient.
- 17% have access to (unreliable) grid electricity.
- 80-90% use wood biomass for cooking; most use kerosene for lighting- huge IAP health implications.
- Government immediate focus on mega-projects. (Omo,Geothermal KGDC, Turkana Wind, KETRACO, more than rural access to clean energy)
- Many private sector companies and organised rural communities ready to develop, produce, use and distribute sustainable modern renewable energies.

Photo Sue Canney , Hells Gate 2010

FIRST/ SECOND GENERATION BIOFUELS

Lessons learned:

- Pay attention to land acquisition and change processes
- Structure financing and activities to expect and/or mitigate delays and according to whether you are investing into already established techonology or large-scale ‘research’.
- Pilot test agroclimatic conditions.
- Lower political, financial, infrastructural dependencies and choose uncontroversial sites.
- Be clear about the extent of social inclusion and environmental impact.

Photo: Sue Canney Sun Biofuels Mozambique 2011

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DEG Jatropha Support Programme

9 private companies, the German Ministry of Cooperation and Development

Under what conditions is Jatropha commercially viable as a biofuel feedstock in East Africa?

The sites

Same trials at each site, however:-
- •As far as 2000 kms apart
- •Different altitudes e.g 45M ASL – 1900 M ASL
- •Different maximum, minimum and mean temperatures. 6 degrees C- 37 degrees C
- •Different soils. pH currently between 5 – 7.5
- •Different rainfall patterns and annual precipitations. 250mm p.a.- 1300mm p.a.
- •Different natural fertilisers. e.g. cow slurry, coffee husks, sisal waste.. elephant dung…..
- •Different pests and diseases.

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The D1 Oils Zambian out-grower proof of concept - progress to date

Area suitability maps developed for the Eastern Province region

Extensive agronomy and operational knowledge compiled into a detailed *Jatropha curcas* Extension Manual detailing standard operating procedures

Detailed crop and activity calendars and nursery and planting guidelines for farmers produced

Quality of results on the ground improved by careful farmer selection (land suitable for Jatropha, sufficient labour and land); restriction of the no. of trees planted in year 1 to 400 “quality not quantity”; integration of intercrops with Jatropha; strengthening of extension team

Best agronomy practices successfully transferred to Jatropha growers via 5 training farms, 70 demonstration farms and 5 extension agents

Market stimulated through active purchase of Jatropha grain (150 MT in 2011)

Trust developed with out-growers through honest, consistent communication; honouring of promises; year-round extension presence on the ground; fair and transparent pricing

Income generated in EP in last two seasons (seedling production and sales, grain sales, buyers commissions, store rentals, transport....): 72,000 USD

Use Agricultural Waste: Sisal Biomass To Energy

1. The Problem

- 30,000 acres plantation / 22,000 acres sisal
- 550-900 tonnes/month fibre > up to 18,000 tonnes waste
- 1200 tonnes methane / year
- 10.6 million sisal boles every year > 106,000 tonnes combustible material
- Company energy consumption: 2.6m kWh; KES 16/kWh; total cost KES 40m

Tanzania Sisal

1964 >450,000 Ha 1964
2010 50,000 Ha
Current aim:
123,000 Ha estate + 22,000 Ha outgrowers within 10 years.

2. The solution

- Wet leaf waste in a biogas digester produces methane which is burnt to produce steam
- Boles from the fields feed a combustion boiler to produce steam
- Steam turbines create electricity which covers 2MW plantation needs and feed 11 MW into locally built transmission system

Sisal company photos 2011

Pipal

Sisal Biomass To Energy

4. Potential Benefits

- **Company: own power cost reduces to KES 7/kWh > $260,000/year**
- **Company: carbon credit (avoided methane) > $250,000/year**
- **Households: small - $45/mth/hhold > $820,000/year**
- **Households: medium - $290/mth/hhold > $7.3m/year**
- **Businesses: small - $195/mth/business > $200,000/year**
- **Businesses: medium - $1220/mth/business > $7.6m/year (based on World Bank assumptions)**

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What else can the EU do?

Provide in depth inter-ministerial training in GHG and renewable energy and how to actively support and integrate private sector projects into national plans.

Invest in high quality feedstock, production and distribution systems research and development based on current reality

Reach the existing East African Private Sector

Invest in renewable energy investment funds and most of all, in technical assistance programmes to develop Private sector projects.

Photo: Sue Canney. Laying Embrapa sweet sorghum trials Nakuru Kenya

Pipal

Jan Fieten's crazy gasifying stove

Appreciate there is a crisis and create a mechanism to sometimes co-fund the fast development of something truly extraordinary

A natural gasifying stove that burns almost everything (all rubbish, old oil, plastic bags and bottles except rubber and PVC) with almost no emissions at very high temperatures.(700 Degrees C). Can boil water, cook, run a small turbine A unique work of

Photo:Sue Canney: North Freiseland Netherlands 2010