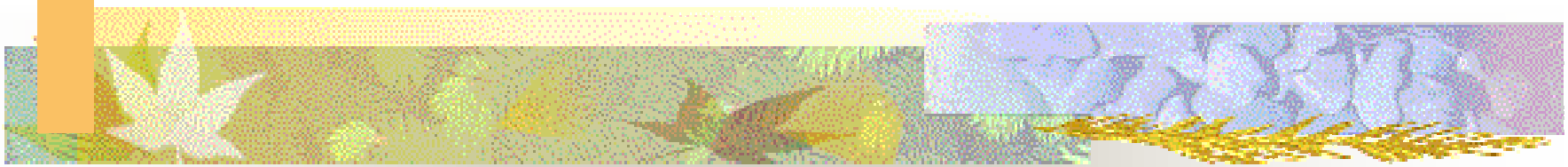
The Energy Economic Benefits of Integrated Development Planning Policies,

by Elizabeth Marshall,Highland Council,Scotland



Contact: Elizabeth Marshall,Area Development Manager,Highland Council,
34A High Street,Wick,Caithness KW14BS.Tel: 00441955605858

Fax: 00441955602444 Email: elizabethmarshall@bioxco.co.uk

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The Johannesburg Plan of Implementation for Renewable Energy, September 2002

- Actions at all levels to substantially increase global share of renewable energy resources
- Increase renewable contribution to total energy supply
- Ensure energy policies support developing country efforts to eradicate poverty
- Integrate energy considerations ,including energy efficiency,affordability and accessibility, into socio-economic programmes
- Integrate energy considerations into planning,operation and maintenance of long-lived energy consuming infrastructures

Examples of Integrated Renewable Energy Projects using Proven Technologies

- Marine Energy-

  The Breakwater Power Station,using renewable energy to pay for prevention of erosion and flooding-integrating wind,tidal and wave power devices into a breakwater barrage composed mainly of waste aggregates.

- Biomass from forest products-

  providing combined heat and power and district heating for a town; promoting biodiversity within the forests through a coppicing and replanting programme,whilst funding new transport routes and links

- Solar Energy- solar cooking

  –use solar to reduce fuel wood scavenging,improve health of local population by providing clean boiled water and food,allow poor rural women to use time gained for earning a living,generating economic development potential

- Biomass from slurries and grasses-using gasification technology to produce heat,power, biofuels, recycle water, generate non-nitrogenous fertiliser.EU Directive-proposals for 35% biological treatment of biowastes,to avoid landfill and incineration following Swedish model

Use of Renewable Energy Generation can solve Enviro- Economic Problems

- Addresses rising sea levels-coastal and inland water erosion
- Promotes flood prevention measures
- Allows land to be reclaimed for new development
- Provides clean fuels,heat and power for new industrial growth
- Recycles wastes
- Prevents land destruction through mindless cutting of wood fuels
- Regenerates forests
- Prevents use of destructive nitrate fertilisers
- Recycles and purifies water
- Promotes employment and wealth creation

Integrating Renewable Energy Technology Economics into Development Planning Policies- Case Study One-Onshore Wind Power in UK

- UK Government policy is to promote renewable energy by a ‘Renewables Obligation’. Power distributors will be fined 2p/Kwh unless they can generate 10 percent of their power from renewable resources by 2010.
- Since April 2001,a Climate Change Levy of 0.43p/Kwh was introduced for fossil fuel generated power for non-domestic[industrial,commercial,public sector]use.
- The effective competitive threshold for all renewable energy technologies,given a large base load electricity pool price of around 2p is approximately 4.4p/Kwh.
- A 20 MW onshore wind farm in UK will now attract bank finance on the basis of a minimum 20 percent return on investment.Estimated average windfarm life is 25 years.
- The profits surplus to the 20 percent return on investment,estimated to average around £600,000 per year, are at present mostly shared between the developer and the owner of the land on which the wind generators are placed,with the developer offering £1000 per megawatt [£20,000 per year for the 20MW wind farm] to the local community.
- Development Planning policies are now being revisited to target the profits surplus to benefit the wider community.This is the challenge- to integrate this long term profits surplus into an effective policy for sustainable local development planning as well as national economic benefit.

Integrating Renewable Energy Technology Economics into Development Planning Policies-Case Study Two-Tidal and Wave Power for Breakwater Power Stations

- Recent successful prototype testing in UK for both tidal power and wave power technologies suggests that given optimal conditions,including size,these technologies should be able to compete with wind power,in the range of 4 to 5 p/Kwh,on the basis of a capital cost of £1000/MW installed
- Combining tidal,wave and wind technologies into a breakwater power station therefore looks particularly attractive,given the possibilities of energy storage either through pumped storage or large fuel cell storage,such as found in Rengenysis technology.
- Revisiting UK and indeed EU governmental policy on recycling waste stone and aggregates from quarries,one can foresee further incentives possible.The use of renewable energy combined with recycling can create coastal protection and flood prevention barrages which will regenerate local economies.
- The challenge to optimising the economics is to promote new approaches to energy policy integration with not only the development of renewable technologies,but also the planning policies, on both a national as well as a regional level,within the international framework provided by the Johannesburg deliberations of 2002.

Integrating Renewable Energy Technology Economics into Development Planning Policies- some comments on Biomass and Solar cooking and the case for further modelling

- Biomass technology economics are well established,but specific to location and objective-for example,whether one uses wood or slurries for energy provision and recycling, depends on need and local availability,as it is important not to have to transport such fuels a distance of more than 20 miles to the point of processing.
- Energy and environmental policies will also stimulate sustainability-for example,the EU Directive on the use of nitrates,given the need to protect land and fresh water courses from slurries.New EU Directive on organic waste recycling and reduction of incineration imminent-will change landfill policies and encourage separation of waste at source.Swedish model possible for 35% organic wastes to be treated biologically.
- Solar cookers are probably the cheapest form of small-scale renewable energy with the potential for mass benefit of the worlds poor-in Africa,India,Central Asia,China and South America.Where many are without electricity or clean water or an easily usable fuel supply, the use of solar cookers as part of a socio-economic package to assist the development planning of remote and poor communities is a least-cost option.
- There is further renewable energy technology economic analysis needed to develop optimal policies to suit the differing socio-economic environments around the world.It is hoped this paper illustrates that integrated development planning policies are needed to optimise the energy and economic benefits of renewable energy technologies. References will be made available to those interested in collaboration on integrated sustainable development planning in the spirit of Johannesburg.