



Biomass & Renewable Energy **Challenges and Opportunities** **in Pakistan**

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wellbeinggreen

"doing our bit for the environment"



Energy Situation in Pakistan

- Energy is a vital input for economic and social development.
- Pakistan remains energy deficient, despite its substantial energy resources.
- Much of the population does not have access to modern energy services.



Energy Situation in Pakistan

- Pakistan obtains its major energy needs from a variety of fuel sources.
- Energy supply and usage statistics ignore the significance of **biomass** which accounts for a substantial proportion of total energy consumption.



Energy Consumption by Economic Sectors in Pakistan

	Without Biomass ¹		With Biomass ²	
	Metric tonnes of oil equivalent (x1000)		Metric tonnes of oil equivalent (x1000)	
Industry	8,663	34.3%		
Transportation	8,785	34.7%		
Households	5,709	22.6%		
Agriculture	675	2.7%		
Commercial & public services	1,452	5.7%		
Total energy consumption	25,257	100.0%		

1 Pakistan Energy Yearbook
 2 World Resources Institute



Energy Consumption by Economic Sectors in Pakistan

	Without Biomass ¹		With Biomass ²	
	Metric tonnes of oil equivalent (x1000)		Metric tonnes of oil equivalent (x1000)	
Industry	8,663	34.3%	13,247	26.7%
Transportation	8,785	34.7%	8,612	17.4%
Households	5,709	22.6%	25,801	52.0%
Agriculture	675	2.7%	746	1.5%
Commercial & public services	1,452	5.7%	1,171	2.4%
Total energy consumption	25,257	100.0%	49,577	100.0%

Considering the usage of **biomass** the fossil fuel dependence reduces to nearly half

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Households -The fastest growing energy consuming sector in Pakistan

“Household Sector still accounts for 50 % of total energy consumption of which **biomass** provides 78%.
(IEA 2005)”



The Significance of Preceding Slide?

- Unfortunately in the Household Sector the dependence on **biomass** is not on renewable sources but on forest resource depletion.
- A very dangerous trend considering the fast increasing needs for energy in this Sector.



Effects of Biomass Consumption by Households

- The continued use of traditional fuels carries significant socio-economic and environmental costs.
- Impacts are seen most clearly in rural households where the consumption of non-commercial energy is mostly concentrated.*

*The World Health Organization (WHO) reports that smoke emissions from household use of biomass are the third leading health risk in South Asia. (Pakistan: Oil and Gas Sector Review July 10, 2003)



Biomass fuel : A Financial Burden ! On the less Privileged

“In **2007-2008**, average rural household expenditure on **biomass fuel** was **Rs. 400 per month**”



A Huge Potential Market!

“Total expenditure by 13 million rural households on biomass is US \$ 750 million/yr”

Which is more than 50% of the total Official Development Assistance received by Pakistan per annum and more than three times the ODA received from the United Kingdom



We Believe

- Alternative and Renewable Energy Technologies have great potential.
- Shifting from traditional and polluting fuels to renewable energy and modern biomass technologies is imperative.
- We need to replace kerosene as the source of lighting and firewood as the fuel for cooking and heating.
- Solar powered lighting and agricultural waste rather than firewood provide potential solutions.



Solar Potential

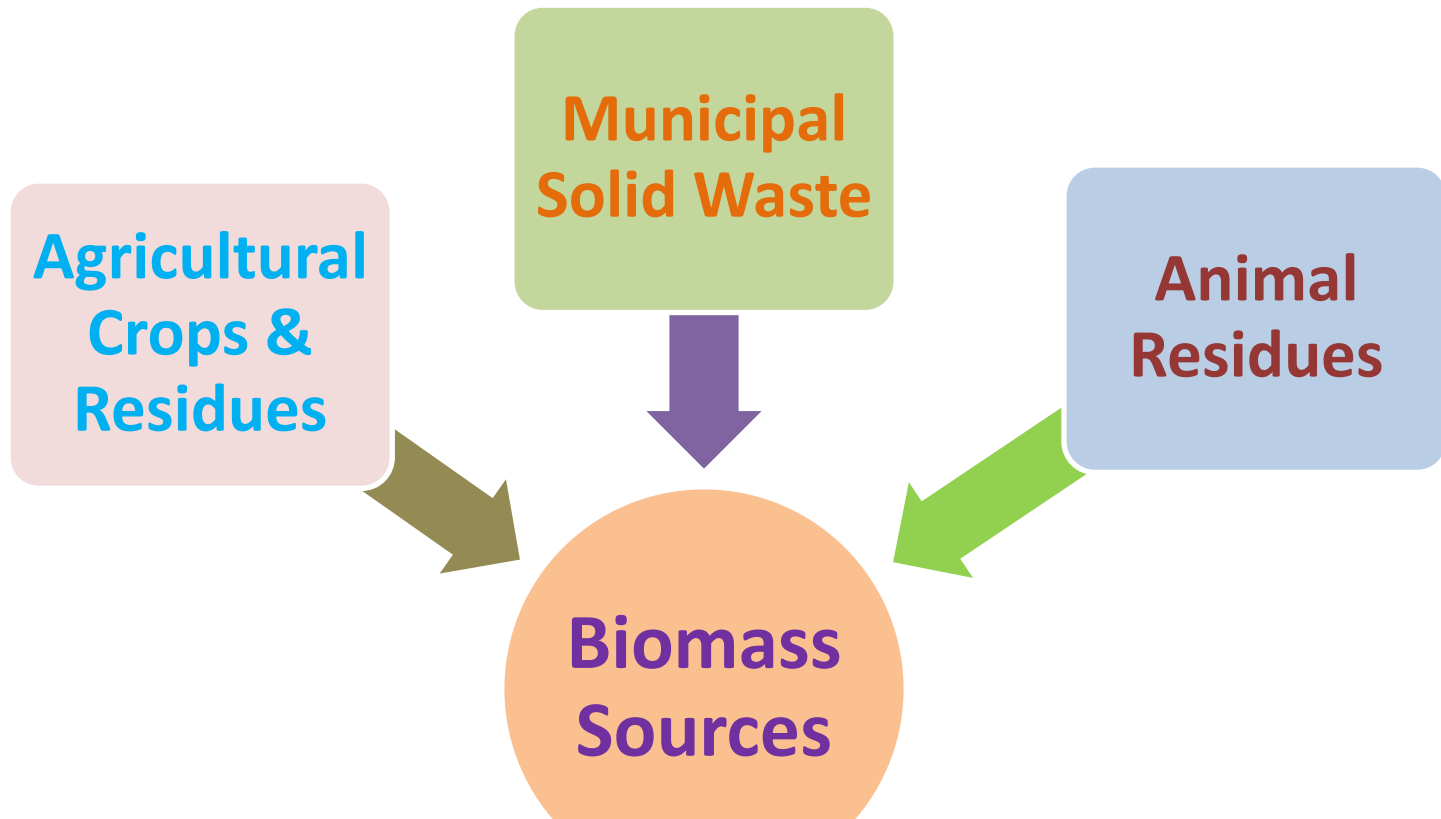
SOLAR PV IN RURAL BACKGROUND



- Most areas of Pakistan offer excellent conditions for harnessing solar energy
- Solar Energy availability: 2300–2700 hrs /year



Sources of Biomass Available as fuel



The Challenge

Promoting the adoption of alternative technologies such as:

- Biogas plants based on dairy manure.
- Efficient solar and biomass based cooking stoves.
- Biomass gasification units for micro power generation.
- Solar lighting & home systems.



The Task is Enormous

- Some 80 million people and 40,000 rural villages are without access to electricity.
- Almost exclusive use of non-commercial fuel for cooking and heating by rural population.



Government of Pakistan's Rural Electrification Programs

- Rural electrification of villages is being implemented close to the grid by PEPCO.
- Energy services to 7,874 villages far from the grid assigned to the Alternative Energy Development Board (AEDB) through renewable energy sources.



Barriers to Government's Energy Initiatives

- Rugged terrain
- Shortages of electricity and gas
- Limited financial resources

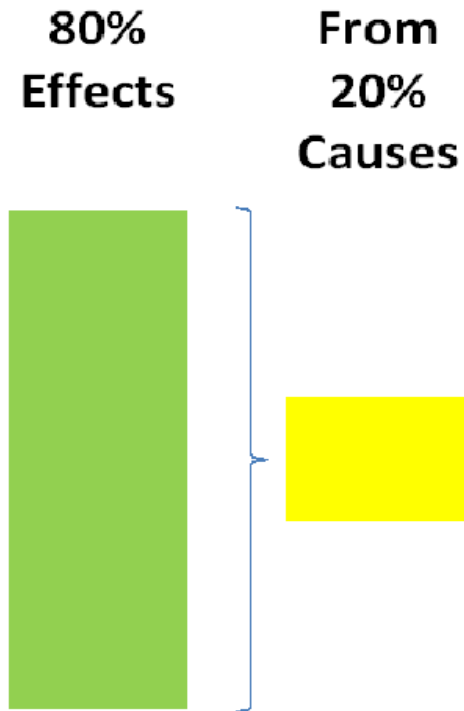


What Wellbeinggreen Can Offer?



THE PARETO PRINCIPAL OR THE 80-20 RULE

“For many events,
roughly **80%** of
the effects come
from **20%** of the
causes”



Pareto Principle

- 100% solution to electric grid and gas connections cannot be offered.
- **Can we offer Rural Households 80% of the benefits for 20% of the cost and at a cost that they can afford ?**



Example: Lighting as a First Step

- The metaphor of a ladder is often used to describe a household's gradual climb from very inefficient energy services to more efficient energy services.
- Lighting is the first step on the ladder of modern energy services.
- Lighting provides high social, economic and environmental benefits at a low cost.



Wellbeinggreen under the CDM

- **Wellbeinggreen Rural Lighting Program**
 - Provision of solar powered lanterns to un-electrified rural households in Pakistan.
 - Replace the kerosene lantern as the lighting source.
 - Reduce greenhouse gas emissions.
- **Can we do the same thing for cooking ?**



Partners of Wellbeinggreen

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**EFFICIENT POWER
INVERTERS**



Any Question?

If you have any queries please
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Thank You

