DP CleanTech

Clean energy, natural solutions

Biomass and Waste to Energy Power with High Efficiency & Multi-Fuel Technology in Asia

OR

"Wisdom from Waste"

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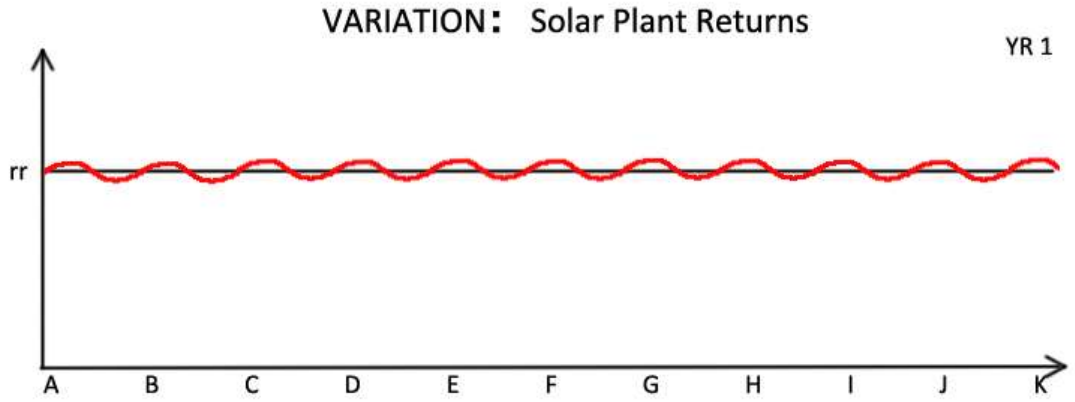
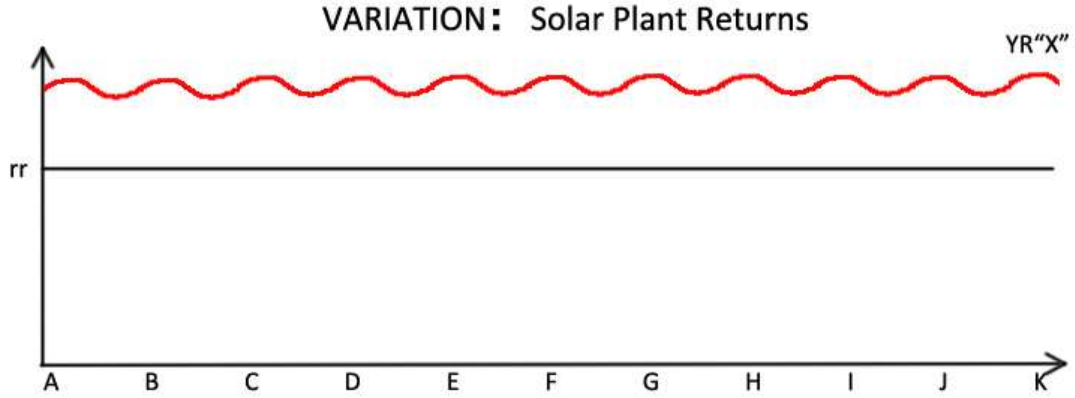
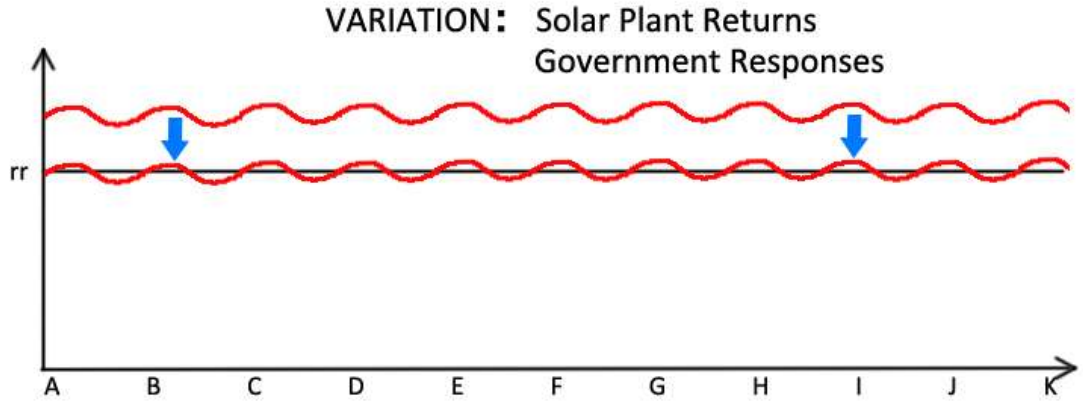
Biomass: why bother?



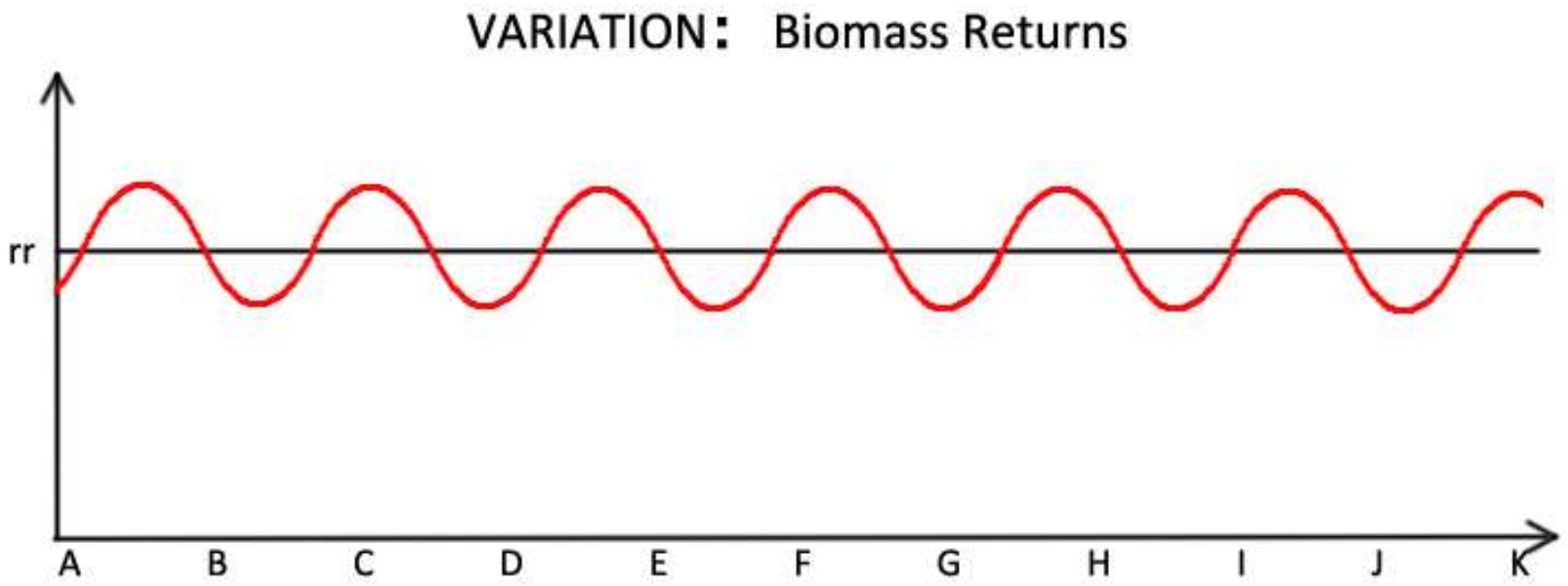




Biomass vs Solar

Depreciation = Circa 85% of costs

*rr = Required rate of return



Depreciation = 15% - 20% of costs

Biomass power is difficult

- ✓ Biomass fuels are complex and messy
- ✓ Potentially huge losses
- ✓ Technology doesn't work
- ✓ Plants are small, distributed power
- ✓ Difficult to finance
- ✓ Does not sit well with "Old Asia"

Is this the same for WtE?

- Easier – and yet more difficult - than biomass
- Get paid to take waste
- But power lies with fuel collectors
- Somewhat easier to finance
- MSW is more complex and corrosive
- Distributed power – but scaleable

So really, why bother?

Align yourself with long term Government policy

- Food security
- Social redistribution of wealth
- Environment

Learning from the China biomass experience

Early development
3 pilot projects

2 x CFB	Projects failed	Modifications to technology. Mass deployment from big utilities. Rapid growth	Many plants failed Unsustainable economics
1 x HPHT	Successful operation	30+ power plants built and successful operation	Declining profitability but still viable

Overalll, loss of confidence in industry by Big 5 and investors

Smart operators have worked out why plants fail and are planning for the future.

Learning from the China experience

In the beginning….

- The first pilot plant relied extensively on imported technology and expertise
- Progressive Government policies were in place
- Financial institutions initially supportive

➢ Initial euphoria led to rapid growth of the industry and the ‘land grab’ of licenses.

Where did it go wrong?

- ‘Underinvestment’ in feasibility studies, engineering studies, technical studies
- Limited understanding of profit and loss drivers
- Short term focus
- Existing fossil fuel industry structure struggled to adapt to the differences
- ➢ Resulted in a period of declining profitability, power plant failure and a loss of confidence in the industry
- NOW: Better understanding of the basics, capital costs reduction, cost of ownership focus.

What is the current situation in China?

- Mistakes are still being made, but some smart operators are emerging

- Biomass: Greater clarity in direction for future fuel supply – straw growing; wood declining. We are seeing clear differentiation
- MSW: Still in the land grab phase. Limited differentiation. Now it is coming to Thailand.

SEA- Getting the basics right

- Invest more initially to get it right
- Focus on maximum fuel flexibility
- Focus on availability, focus on efficiency
- Focus on total cost of ownership, not just the cost of purchase
- Plan for the future: Identify and back the long term trends
- Competition rarely declines, so fuel prices will go up

Thank you for your attention