

Renewable Energy Development: Choices Choices Choices

Presented to:
Tribal Energy Program Review
October 2006

Presented by:
Russell Gum PhD
ERCC Analytics LLC

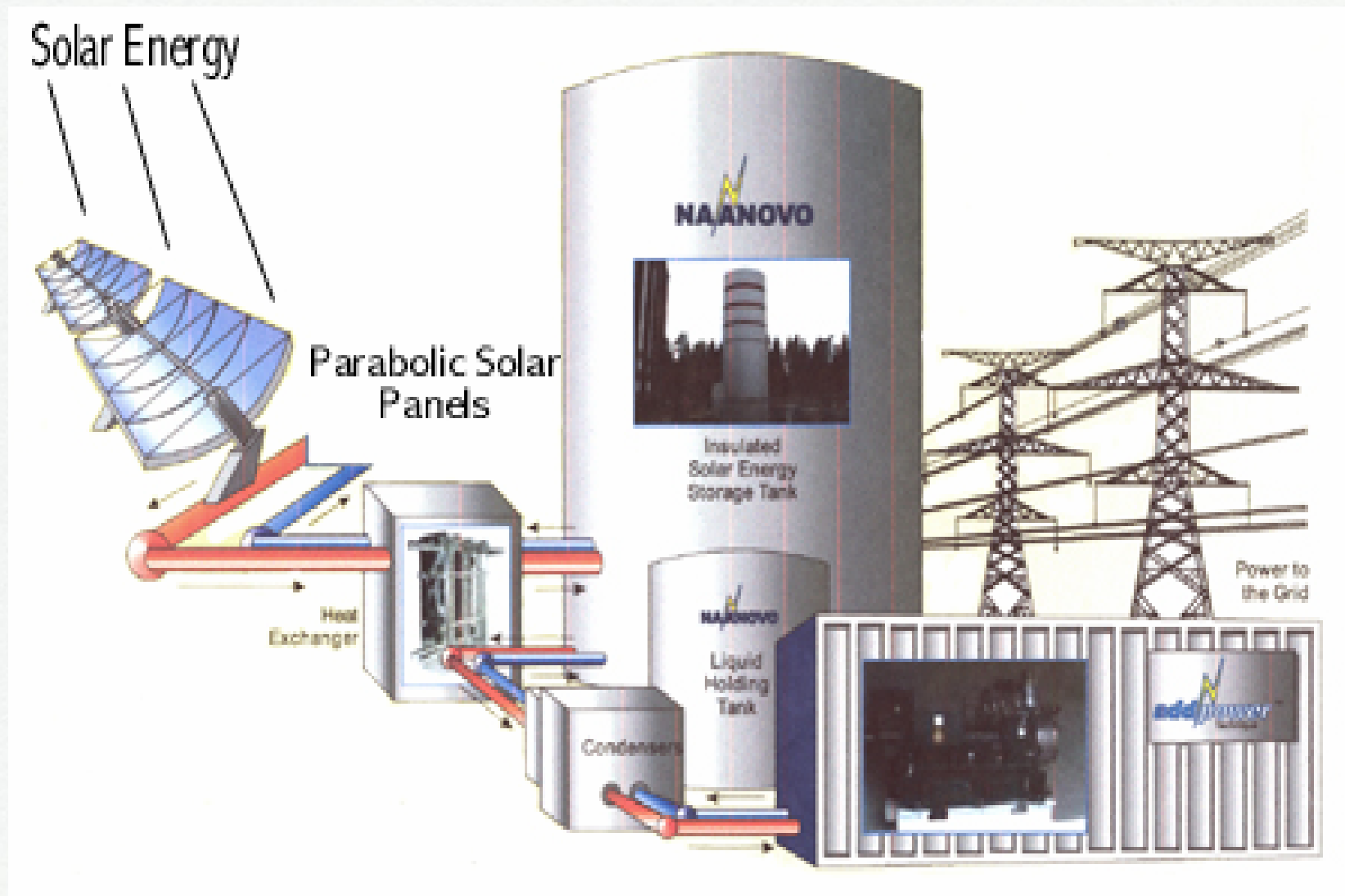
Integrated Energy Model



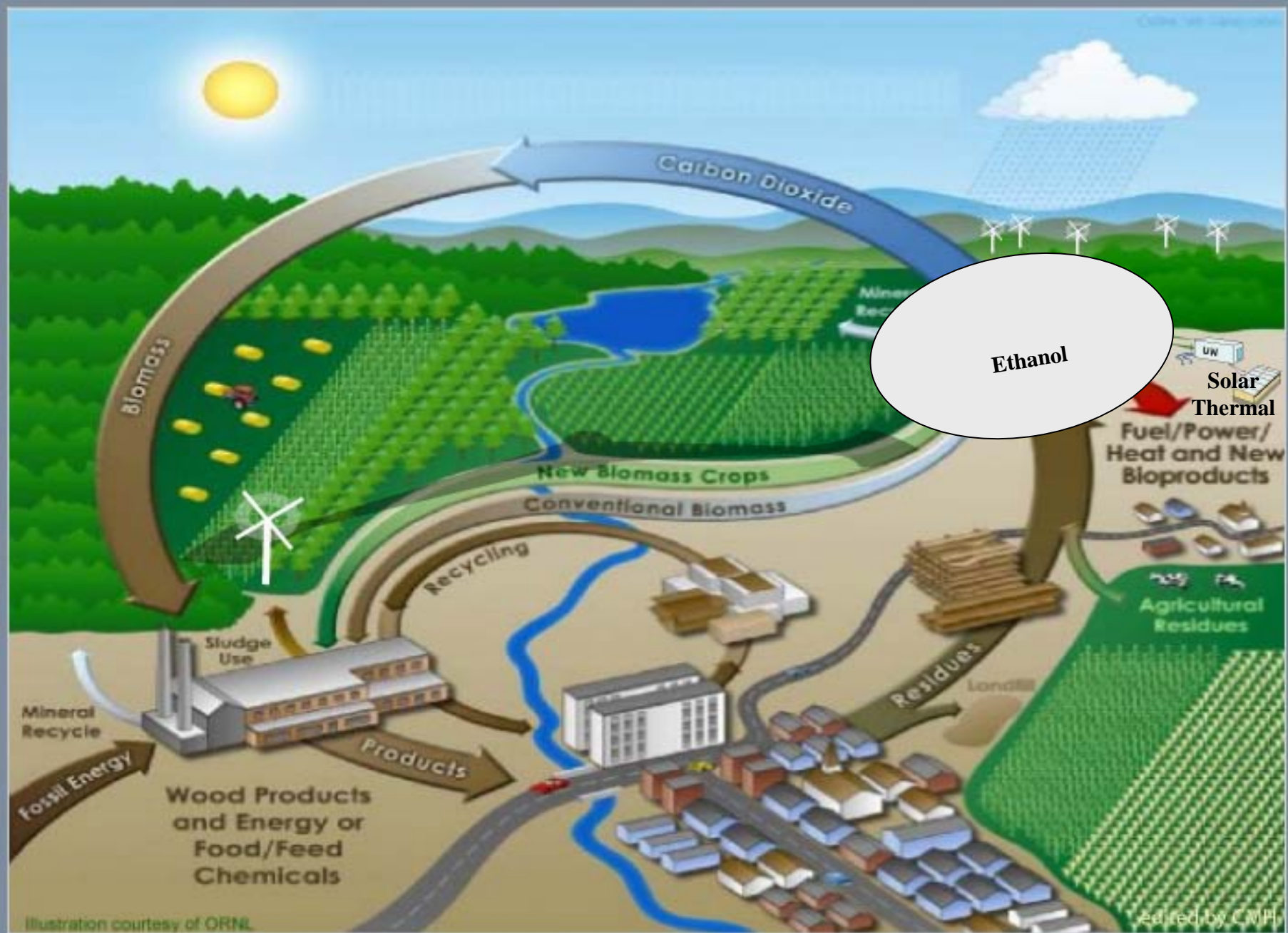
Illustration courtesy of ORNL



Solar Thermal Module



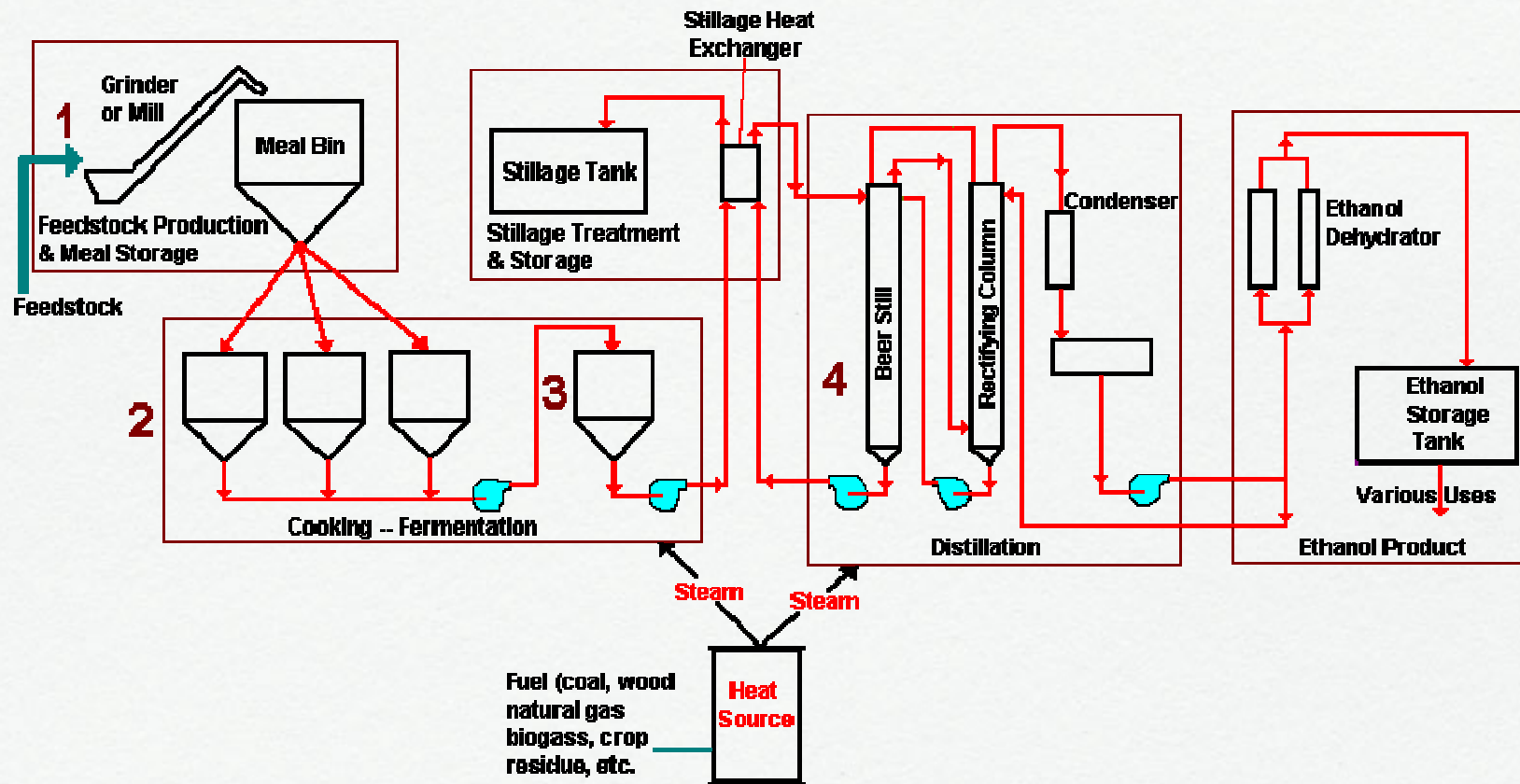
Drawing courtesy of Naanovo



Ethanol Module



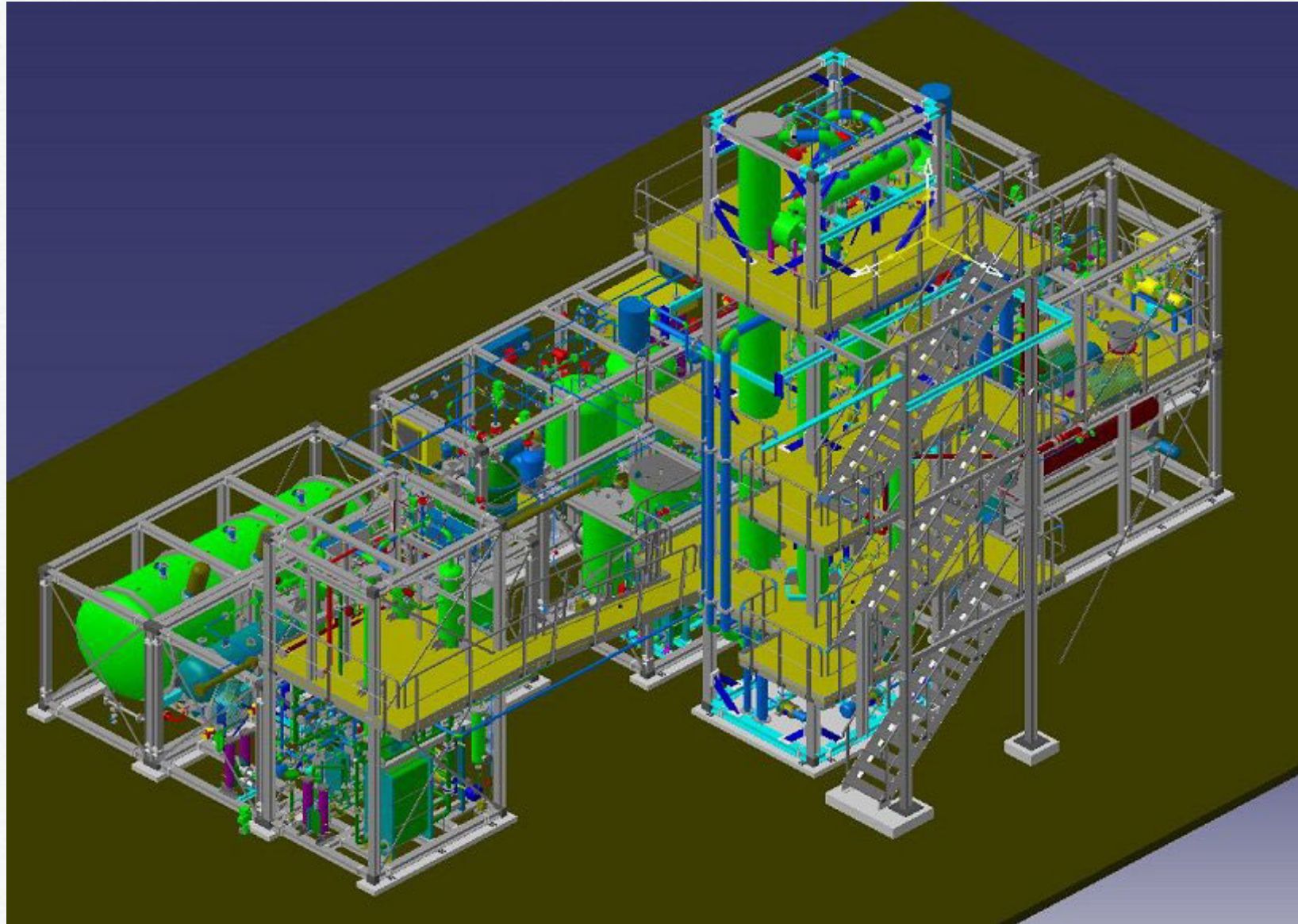
Ethanol Production Very Basic Process-With Integration is Large Scale Production Necessary?





Biodiesel

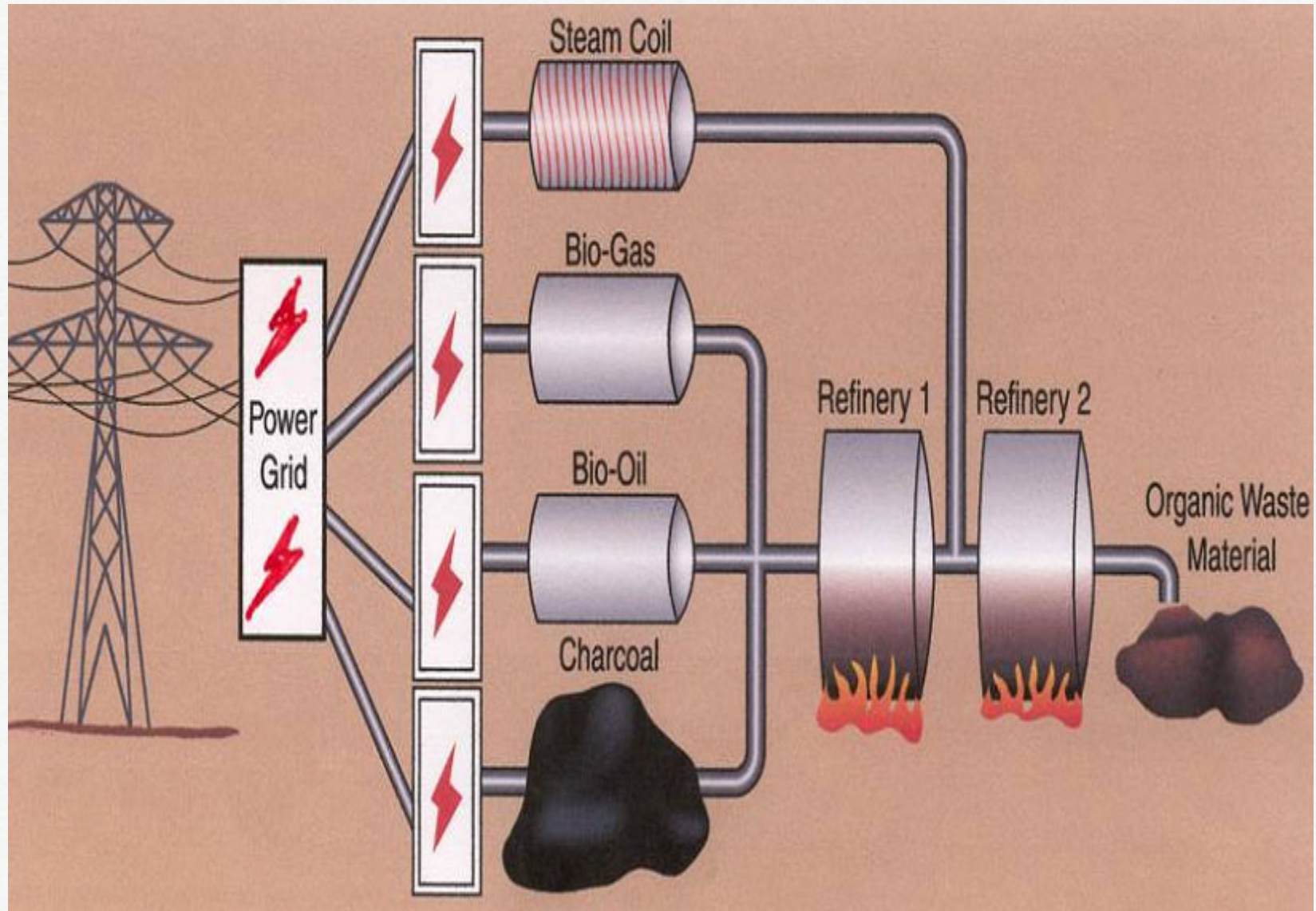
Biodiesel Module



Drawing courtesy of Energea



BioOil Module



Drawing courtesy of JFBioenergy

Integrated System



Development opportunities

- ❑ Wind -- break even and viewed as ugly by some tribal members
- ❑ biodigester -- 5 cent power but need cows
- ❑ biodiesel -- no proven oil crop except for cotton seed. Currently good market for cottonseed. Questions about use of biodiesel in high powered farm equipment.

- ❑ photovoltaic -- 25 cent power
- ❑ concentrated photovoltaic -- 10 cent power
- ❑ thermal solar 1 -- still possibility for 500 MW installation details unavailable
- ❑ thermal solar 2 -- 6 MW installation possible 7 cent power - need engineering surety
- ❑ ethanol -- 1 million gal plant - possible \$2 a gal. Corn yields need test plot. Needs to operate in tandem with feedlot.

Recommendations

- ❑ Slow and steady wins the race
- ❑ Technology is advancing
- ❑ Efficiencies are improving
- ❑ Develop infrastructure (such as a tribal utility) to manage energy
- ❑ Possibilities exist for tribal control of renewable energy developments
- ❑ When a technology looks good do a through analysis to be sure. Then go see the banker, developer etc and install it.

A photograph of a dense forest with moss-covered tree trunks and a misty atmosphere. The trees are tall and slender, with thick green moss growing on their bark. The ground is covered in fallen leaves and ferns. The background is hazy, suggesting a misty or foggy day. The overall mood is serene and natural.

Thank You

A spiral-bound notebook with a black metal spiral binding at the top. The page is white and features a background image of a dense evergreen forest. The forest is partially obscured by a thick layer of white mist or fog, which is more prominent in the upper half of the image. The trees are dark green and appear to be conifers. The overall atmosphere is misty and serene.

Russell Gum PhD CEO

ERCC Alalytics LLC
211 Tonda Vista Rd
Port Angeles WA 98362

Russgum@mac.com