Nufuels Ltd

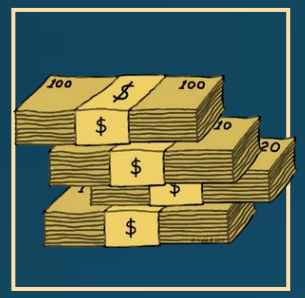
Recovering Clean Energy from Plastic Waste

The Problem

1. Dealing with plastic waste – land and sea
2. Small, poor and remote communities excluded from standard solutions
3. Incentivising waste collection where standard solutions not viable.

A Working Solution: Tackling Pollution and Poverty Together

Design and build scaled systems to recover energy from plastic waste

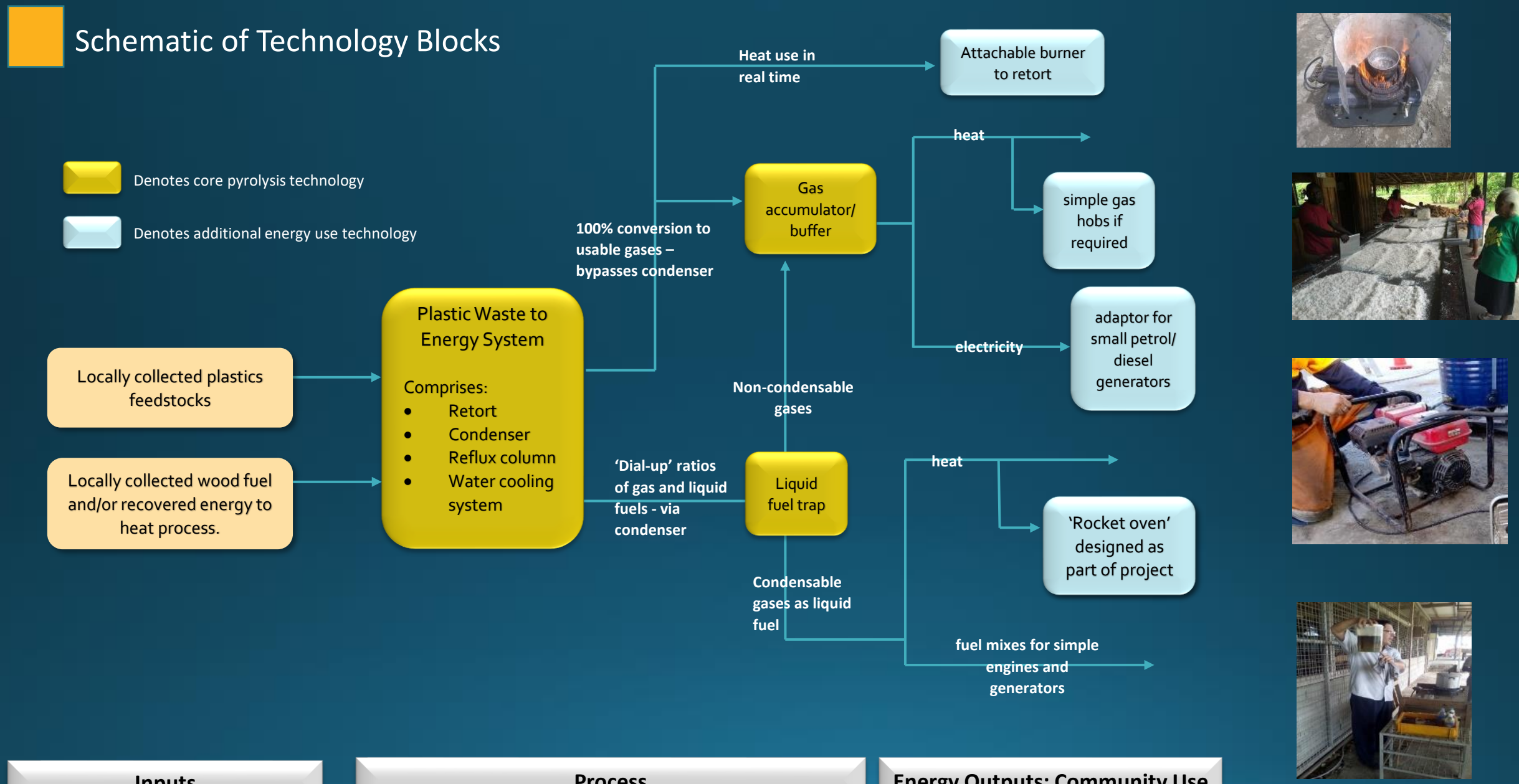


Source external funding for community systems

Community runs system and owns recovered energy

Value of energy produced creates incentive to collect/ manage waste and operate system

Schematic of Technology Blocks

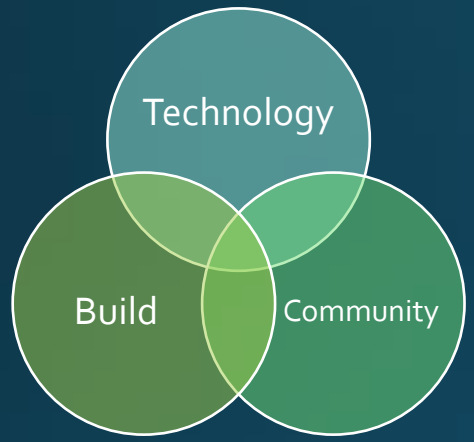


Some metrics – Solomon Islands example

- Per system:
  - Up to 7 tonnes plastics removed annually from environment – depending on plastics density
  - 20% reduction in GHG emissions over standard fuels
  - Up to 8 hours energy from 1 cook
  - Annual energy value created equivalent to annual income for 3-5 households

Potential Demand for Systems - West Pacific Example

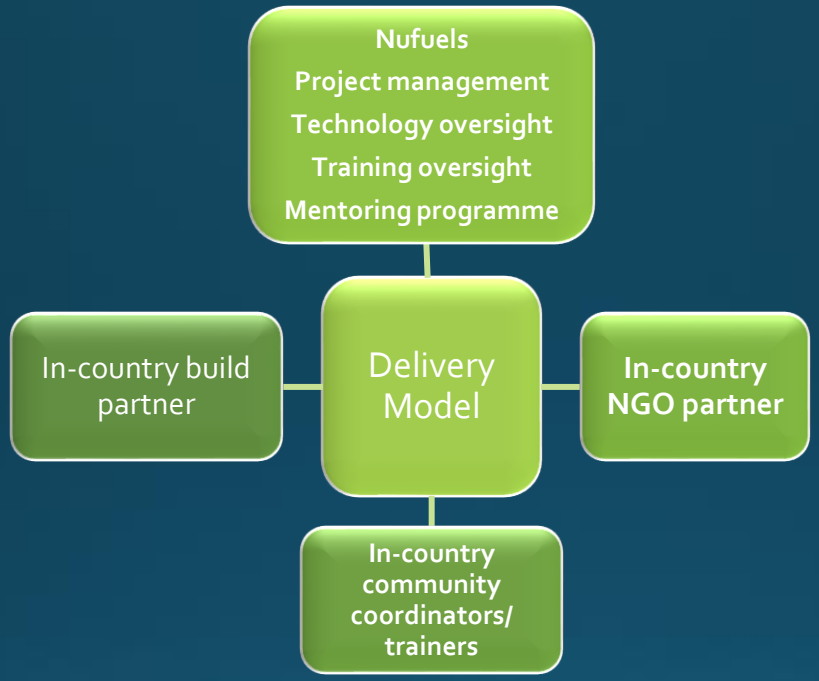
Business Model



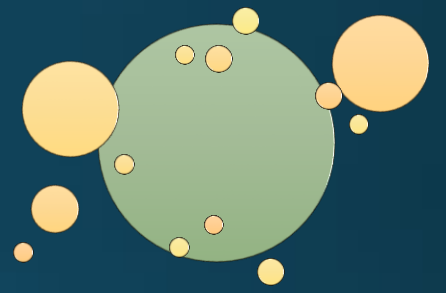
Business growth through unit roll-out.

Product costing covers:

- system build
- community training and mentoring
- project management
- community coordination



Partnership model across projects



Project focused growth

- deliver multiples of units to a range of communities per project
- minimum 3 systems per project

Innovation

Response to Need
Solution for remote, island and poorer communities vulnerable to plastics pollution.

Technology:
Scaleable, simple technology, adaptable to feedstocks, adaptable energy outputs. Gender inclusive design. No obvious market competitors.

Economics
Energy value created incentivises local plastics pollution action.

Total Product
Community wrap around programme to strengthen take-up. Not a dump and run technology philosophy.

Business Model
Intent to grow in-country jobs through partnerships.

Investment Model
Investment funding into on-the-ground projects for communities rather than general business development funding.

Proprietary Technology/ Knowledge, Experience and Expertise

Technology/ Processing

- Scaled system integrated with 'cook' ratios and processing regimes
- Pyrolysis of PET plastics and co-mingled feedstocks

Waste Management Economics

- Feedstocks assessment
- Energy optimisation
- Scaling
- Financial modelling

Community

- Experience in development aid projects
- In-country delivery partnerships
- Community based monitoring and cultural indicators
- Community ownership and social enterprise development from energy value
- Training

Recent projects

- Completed NZ government part funded pilot in Solomon Islands 2018-2019.
- UNDP funded projects for three systems in Solomon Islands underway 2021

Founding Team - Nufuels Ltd

Leigh Ramsey (2nd left with Solomon Islands build partners for 2018 pilot project). Leigh is New Zealand's foremost expert on emulsified fuel and producing "fit for purpose" liquid fuels from waste feed stocks. Led development of community waste to energy technology. Joint lead on Pacific Islands/ Oceania projects.

Dr Gael Ferguson. Background in sustainable development, local government, waste management, community partnerships and sustainable infrastructure systems. Gender inclusive technology design. Joint lead on Pacific Islands/ Oceania projects. Project manager current UNDP project Solomon Islands.

Simon Arnold. MD of arnold.co.nz involved in commercialisation of physics and engineering based innovations, and part-time CEO of the New Zealand National Energy Research Institute. Has had senior roles in manufacturing, public policy and administration. Waste-to-energy technologies and business strategies.