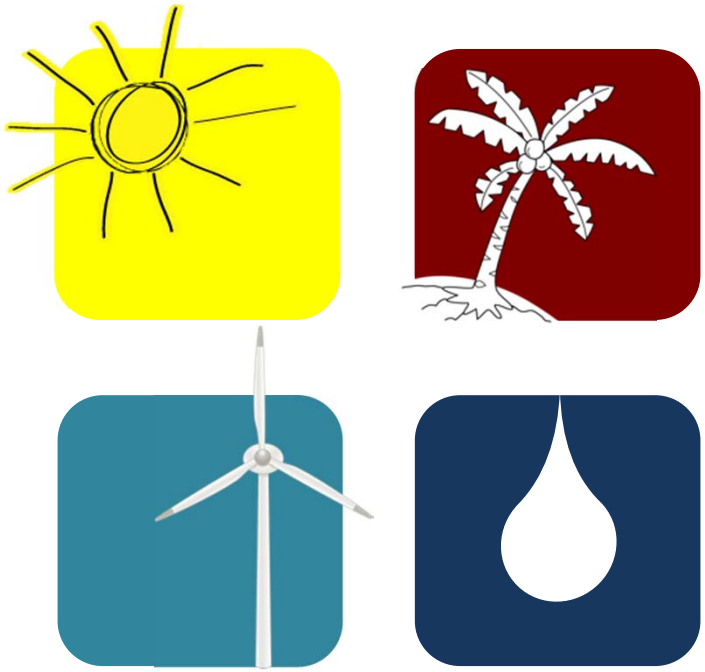


UNELCO/COFELY - DRIVING THE VANUATU ENERGY TRANSITION

Last 10 years ▶ ***Next 10 years***

VANUATU: A quick reminder

Highly Fragmented: 80+ islands

Highly Dispersed Archipelago: 12,200 sq.km land in a 680,000 sq.km maritime zone

Limited wealth: 3,300 USD/capita

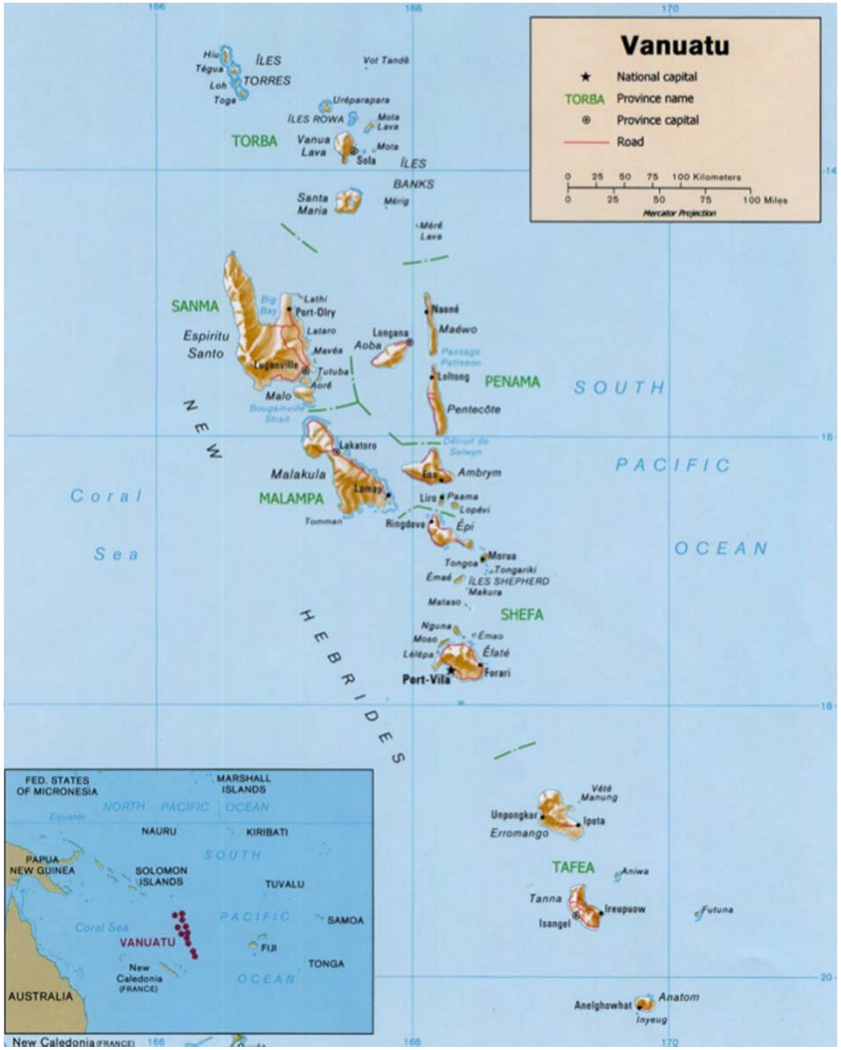
Low population density: 18 persons per sq.km

High exposure to natural hazards: cyclones, earthquakes, volcanoes, tidal waves, landslides, …

But also …

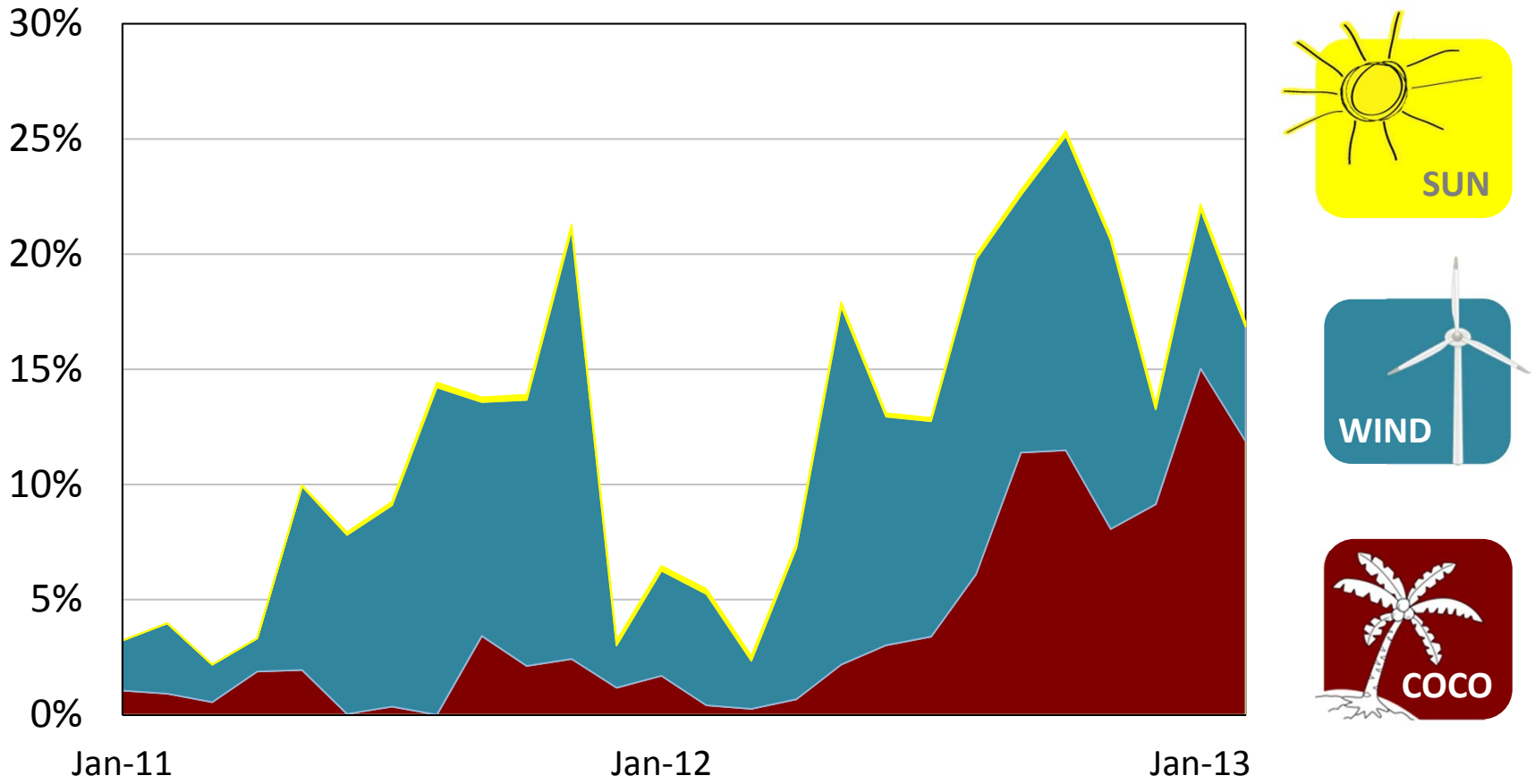
- History and base for **copra production**
- **Multiple natural resources**: Sun, Water, Biomass, Geothermal, …
- One of the **happiest countries on earth**

… and **UNELCO has been a partner of Vanuatu since 1939**

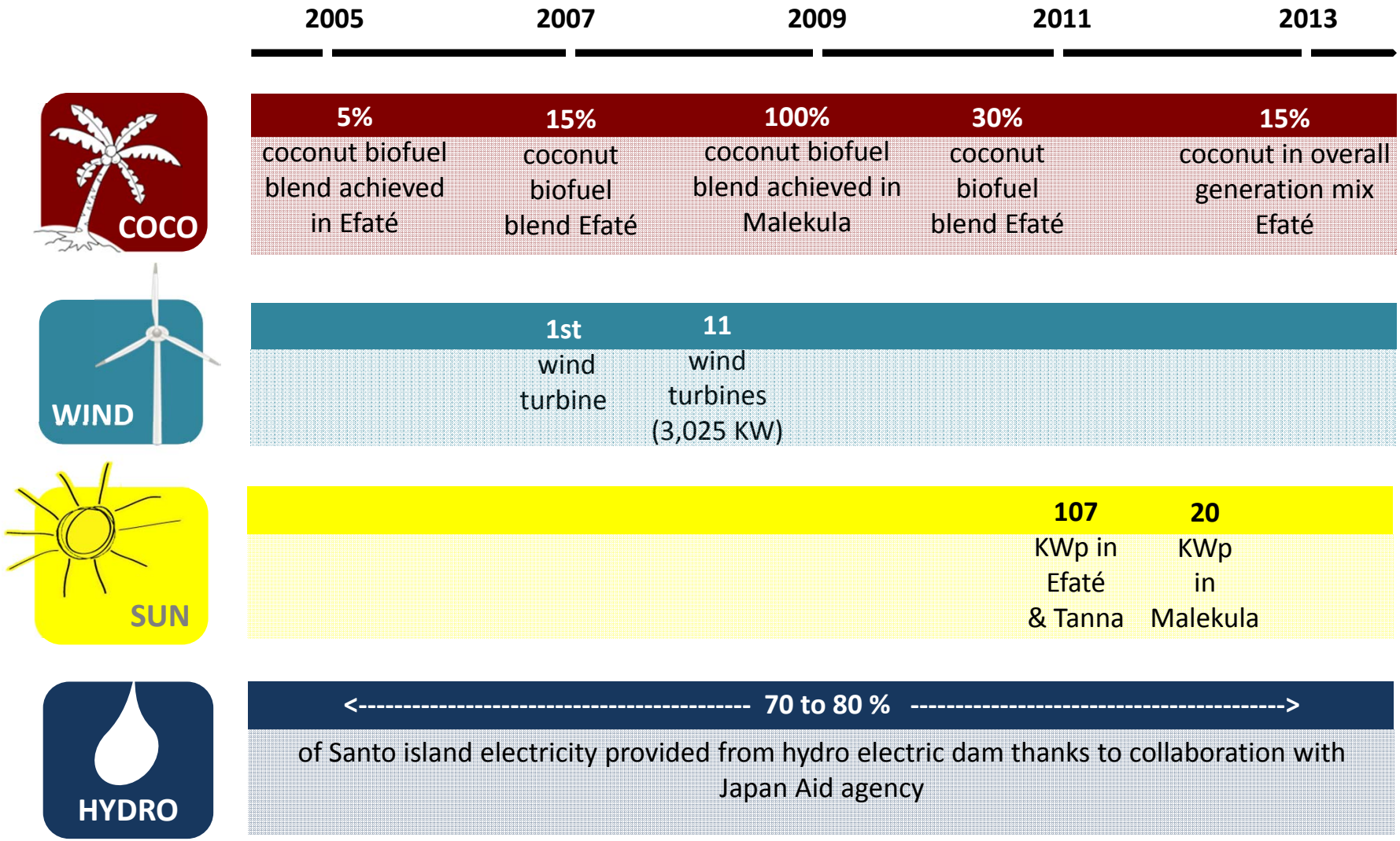


From 100% dependency on fossil fuel generation a few years ago, Vanuatu's main island now benefits from 20 to 25% green energy …

Growth of renewable energy contribution to Vanuatu's main islands' energy mix



… in the last decade UNELCO has pioneered Coco-2-Electricity, constantly pushing the technical and logistical boundaries, while also developing a well diversified mix of other renewable energies …

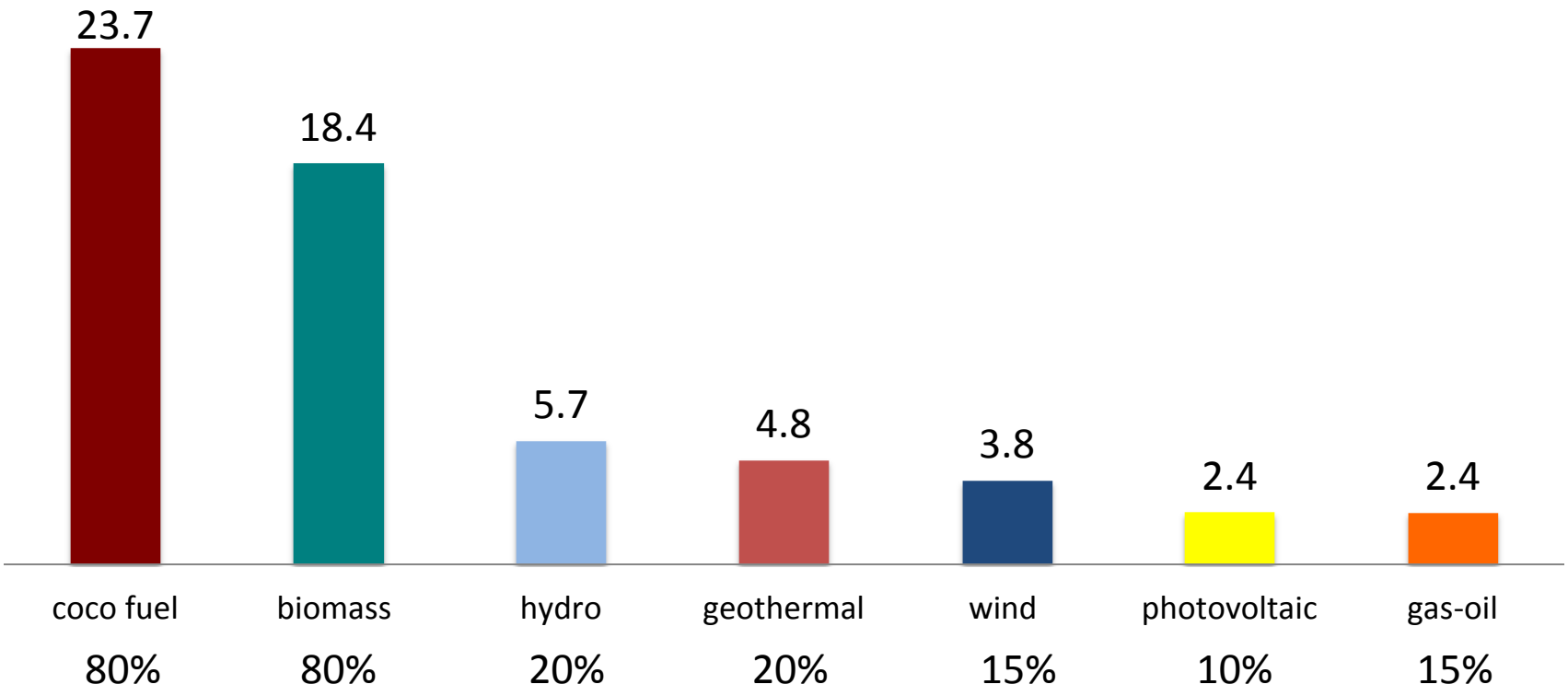


… coconut oil should clearly become an increasingly important energy source for Vanuatu and its development will further environmental objectives and increase energy independence …

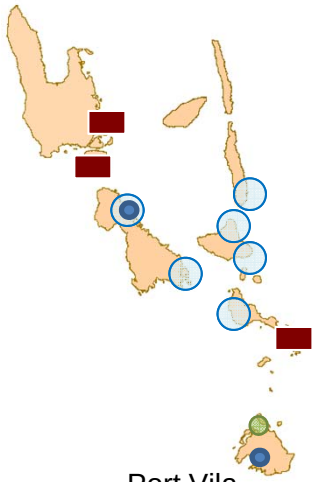
	CURRENT	NEXT 10-years
VOLUME	Vanuatu currently grows enough copra to produce **20 M litres of oil per year**	**Vanuatu could double copra and oil production**
	UNELCO consumes 3 M litres of oil per year	**UNELCO could consume more than 10 M litres of oil per year**
PRICE	Refined oil costs between **1 and 1.1 USD/litre** (depending on market prices)	Process and procurement improvements could **decrease oil prices 10 to 20%** (all things being equal)

… but also provide important economic and social benefits as 80% of its cost is actually recycled into the local economy, with a multiplier effect, and coconut farming and oil extraction employ traditional skills …

Estimate of the Amount Reinjected into the Vanuatu Economy (US cents per KWh and % of cost reinjected into local economy)



… challenges remain, in particular price volatility and supply disruptions but acknowledgement of the importance of coco-fuel for Vanuatu and adoption of a common vision should lead to increased coco-fuel usage in the next several years…



- Copra suppliers
- Third party oil
- Own oil refinery
- Own Plantation

1

Multiplying and diversifying resource supply sources

- **Rehabilitation and development of local coconut farms**
- Procure at **different stages of transformation**
- **Procure from many islands**
- **Entering into the value chain** to hedge against third party risk: own plantation, own oil transformation, …

2

Entering into enforceable long term supply contracts

- Choosing and promoting the emergence of **reliable counterparts**
- Providing **appropriate incentives** to suppliers

… and we will be working both on our own capacity and partnering with the government to align trade and fiscal policies with the best social and economic interest of Vanuatu …

3

Increasing our oil storage and refining capacity to decrease exposure to price volatility and temporary supply disruptions

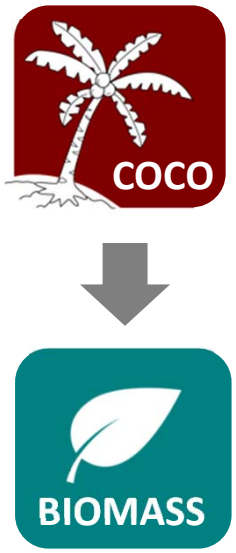
214 000 l storage capacity

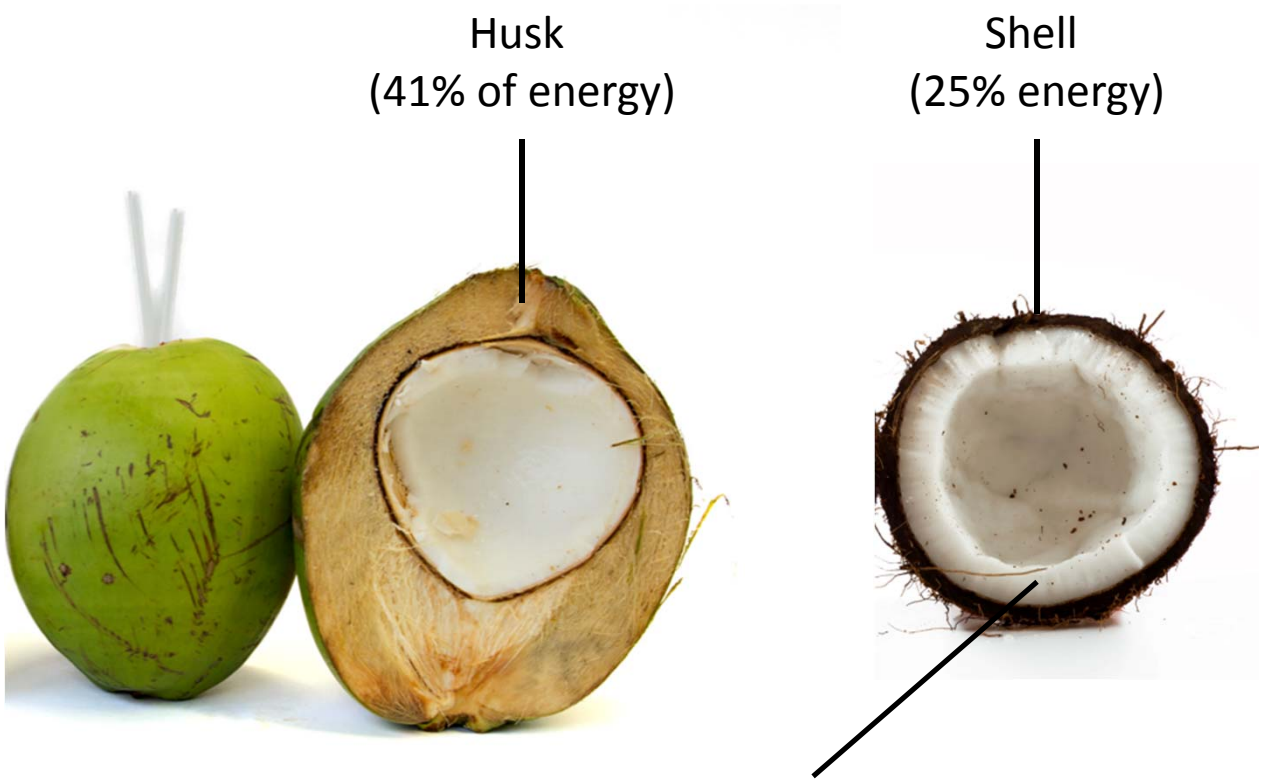
700 000 l/m refining capacity

4

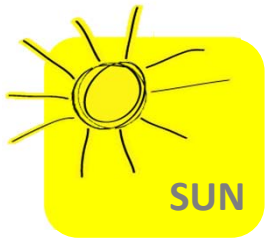
Working with the Government of Vanuatu to align economic and fiscal policy with long term interests of Vanuatu

… streamlining the conversion process and increasing energy recovery from coconuts also offers the opportunity develop electricity production from biomass to further improve the business and environmental case …

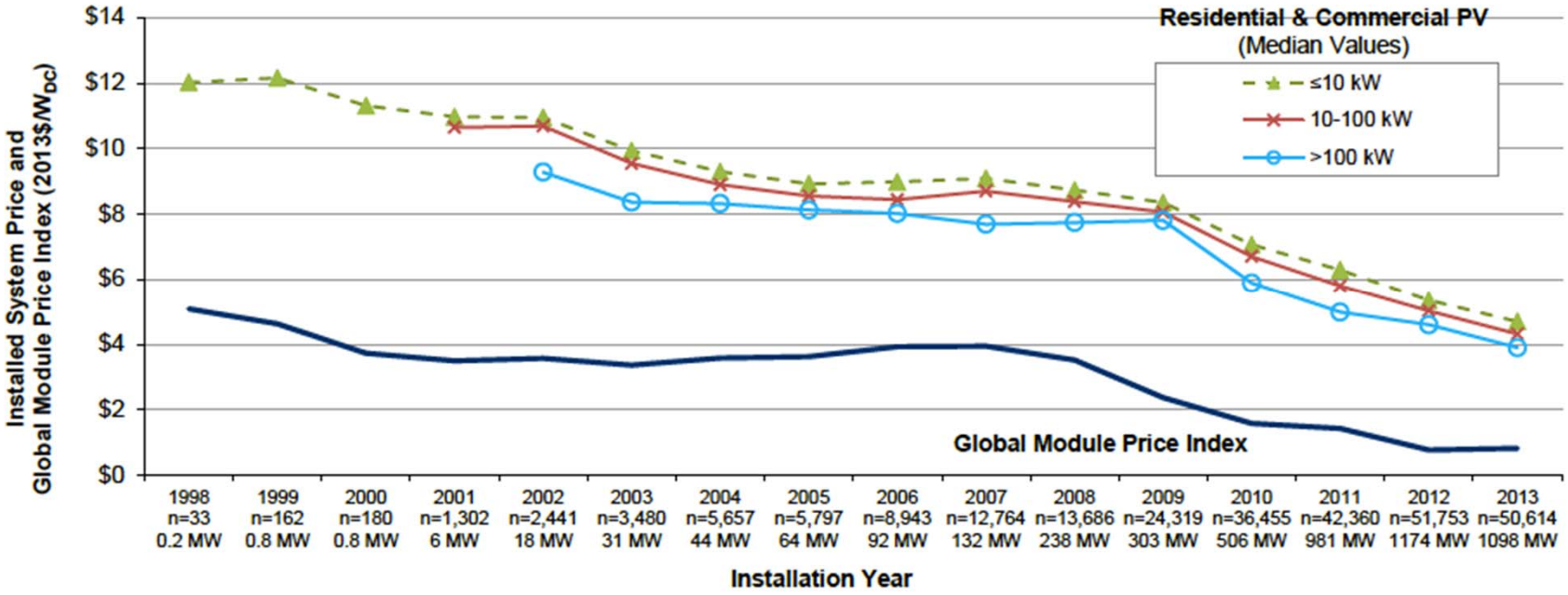




… PV solar has become a no brainer, the only real question is how much can our small insular grid absorb and how long until storage capacity is truly “in the money” so we can deploy a second stage of projects …

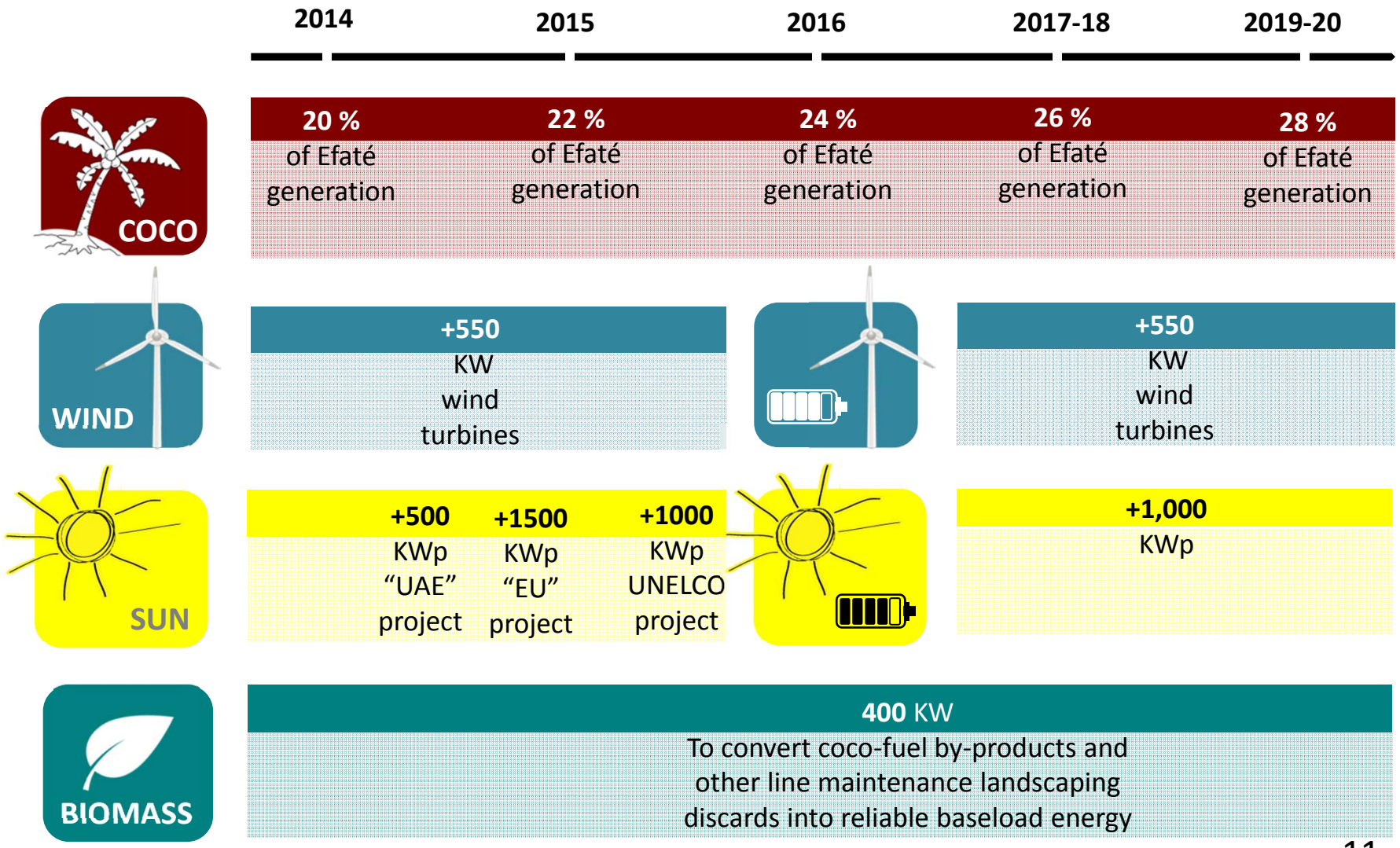


The significant and continued drop in PV prices

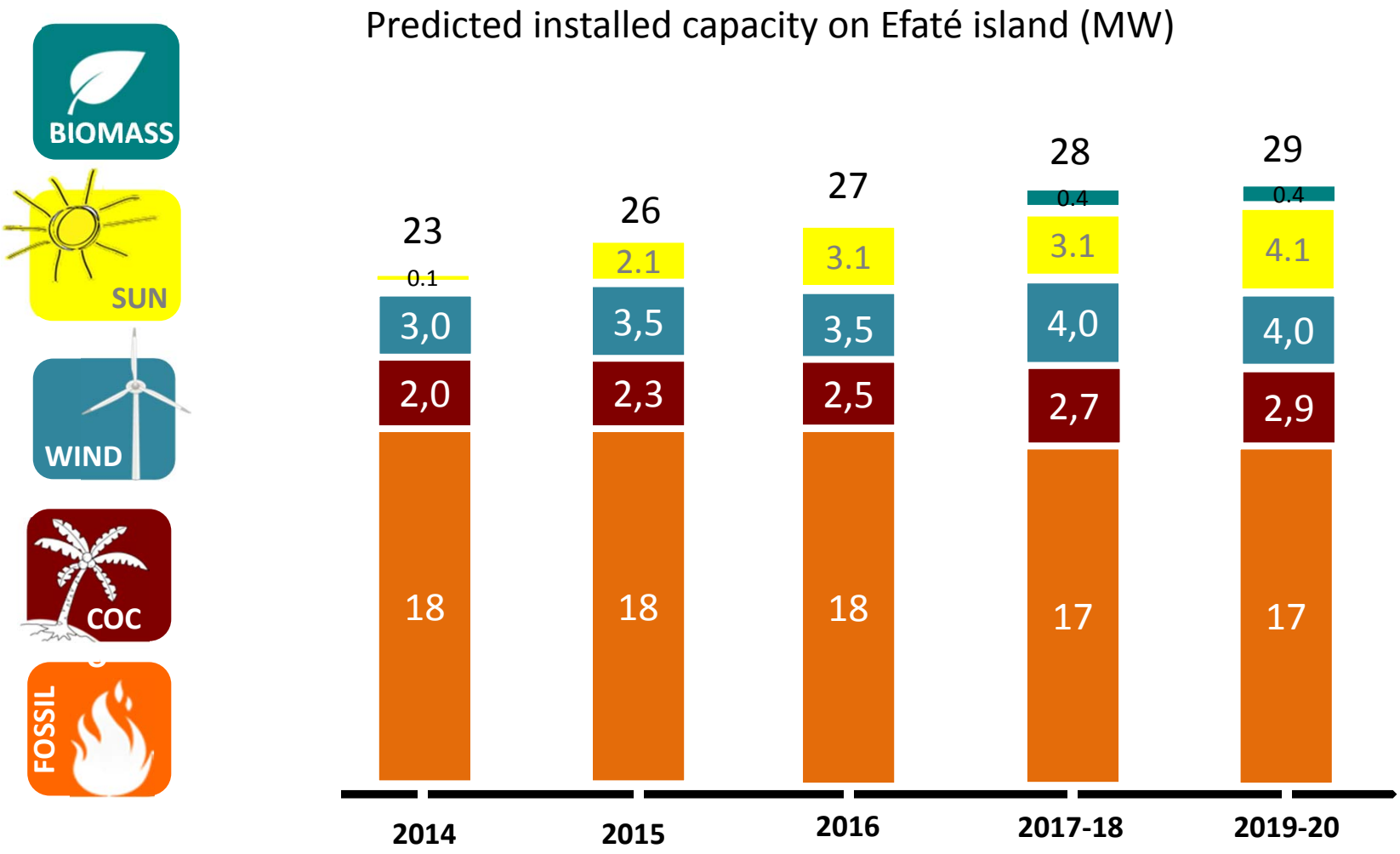


Source: “Photovoltaic System Pricing Trends”, Sunshot Initiative, Department of Energy, September 2014

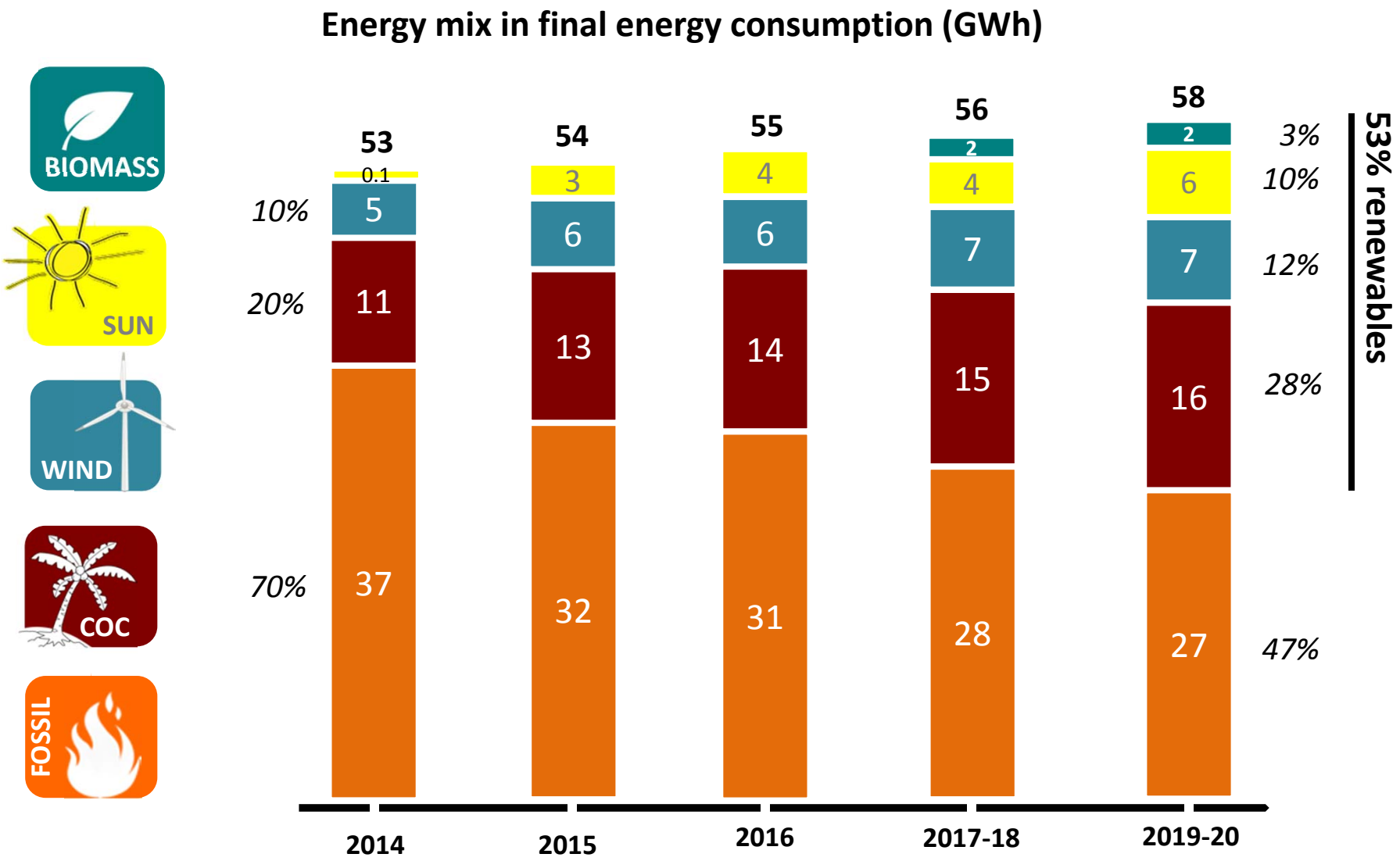
… UNELCO has an ambitious renewable development plan going forward, that will take advantage of solar and storage price drops, as well as the wide ranging benefits of coco-fuel development coupled with biomass …



… in the next few years more thermal capacity will be running on 100% coco-fuel allowing the utility to transition towards greener fuel while not creating stranded assets…

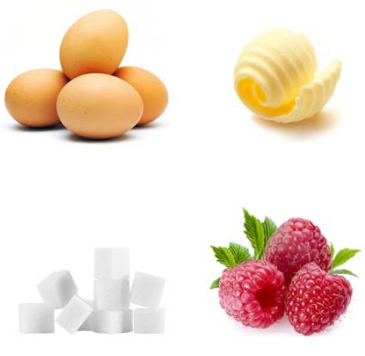


… green energy should represent over 50% of the energy mix on Vanuatu's main island before 2020. The outer lying islands will have the opportunity to directly go from no electricity to mostly green electricity…



… in closing, energy transition could be assimilated to a recipe ...

Good Ingredients **Right Equipment** **Fine-tuned recipe** **Masterful chef(s)**



… it is as much an art as a science, it is an ever evolving, multi-stakeholder process that requires good ingredients, the right equipment and infrastructure, evolving recipes and the collaboration of several masterful chefs.

GOOD INGREDIENTS

Natural resources

Capital

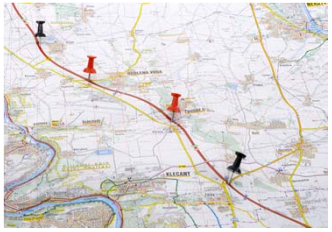
Knowledge & foresight

RIGHT EQUIPMENT AND INFRASTRUCTURE

Robust technical foundation

Policy: Constructive legal, contractual and regulatory environment

FINE-TUNED AND EVOLVING RECIPE



Roadmap

Balancing often conflicting objectives:

- Short term vs. LT
- Expensive first mover vs. cost effective lager
- Different electric stakeholder interests,
- Cost vs. environment,
- Social equity vs. efficiency

MASTERFUL CHEF(S)

Visionaries

Developers

Operators

Governments and Regulators

Financiers

SUCCESSFUL ENERGY TRANSITION

Thank you for your attention