ENERGY UTILIZATION MANAGEMENT BUREAU

New and Emerging Energy Technologies

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E-Power Mo!

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Davao City

Potentials of Innovation and Emerging Technologies in the Philippine Energy Sector

Potential Applications in the Energy Sector

- ENERGY SOURCE DIVERSIFICATION
- ENERGY GENERATION, CONVERSION and STORAGE
- INDUSTRY, COMMERCIAL AND RESIDENTIAL ENERGY USE
- ALTERNATIVE FUELS PRODUCTION IMPROVEMENT
- NEXT GENERATION VEHICLE TECHNOLOGIES

Potential Applications in the Energy Sector

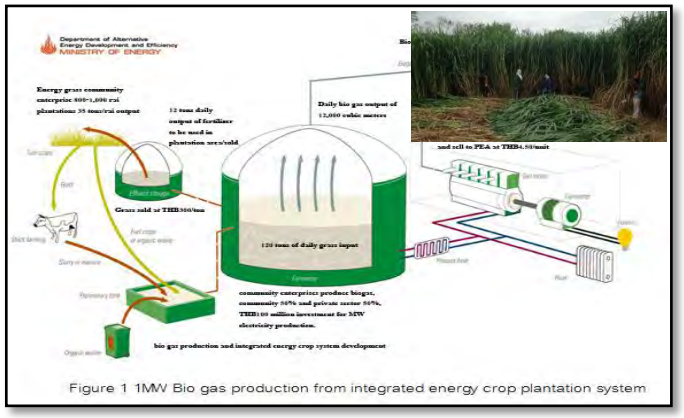
Potential Applications in the Energy Sector

➢ ENERGY SOURCE DIVERSIFICATION

Waste rubber and plastics

Energy from Human Kinetics

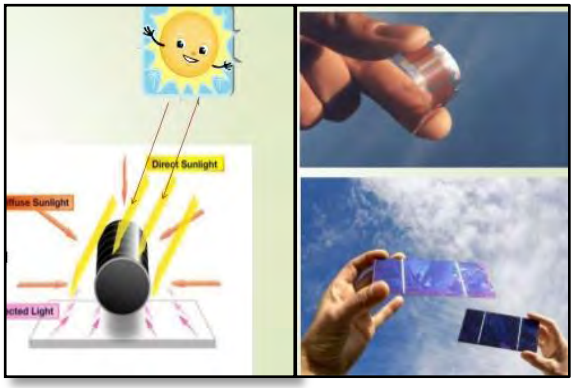
Ethanol Production from Pineapple leaves



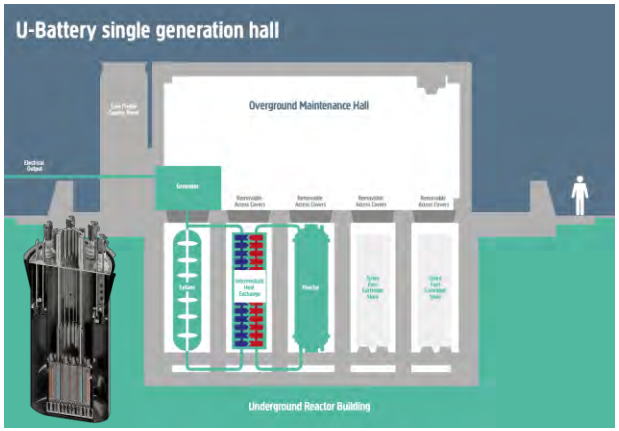
Bioethanol Production from Napier Grass

Potential Applications in the Energy Sector

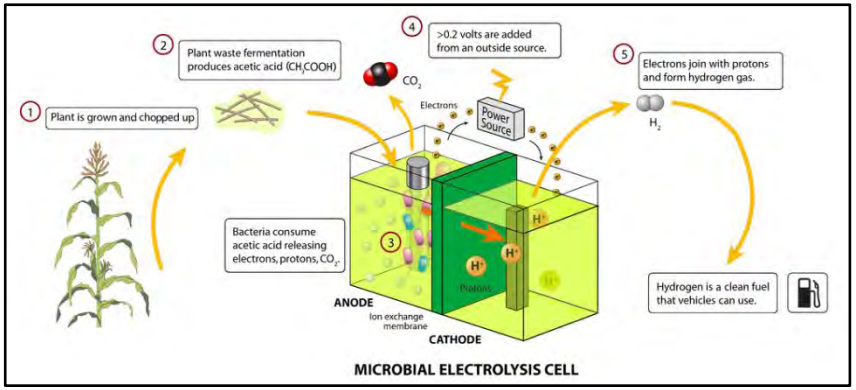
➢ ENERGY GENERATION, CONVERSION and STORAGE



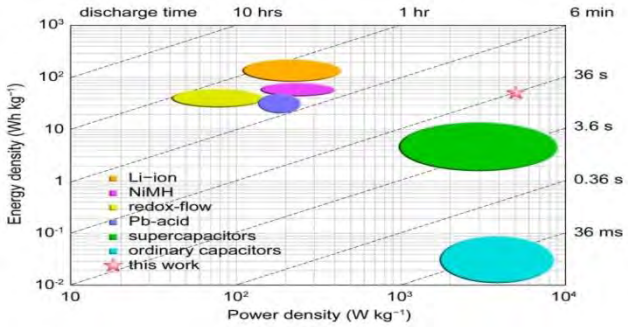
High Efficiency
Nano Technology
Solar Cell



Small Modular Nuclear
(3 Mwe - Canada LeadCold Transportable
Molten lead – uranium nitride)



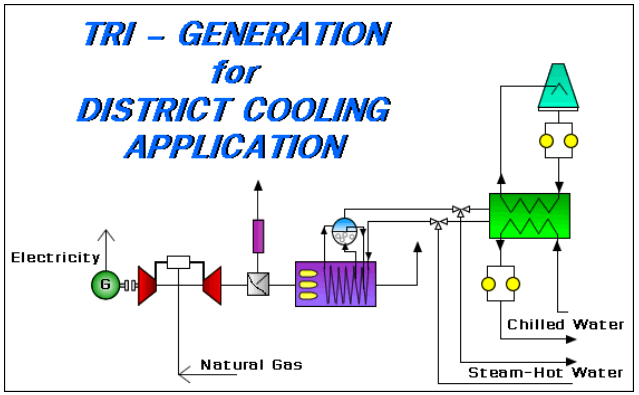
Microbial Fuel Cells



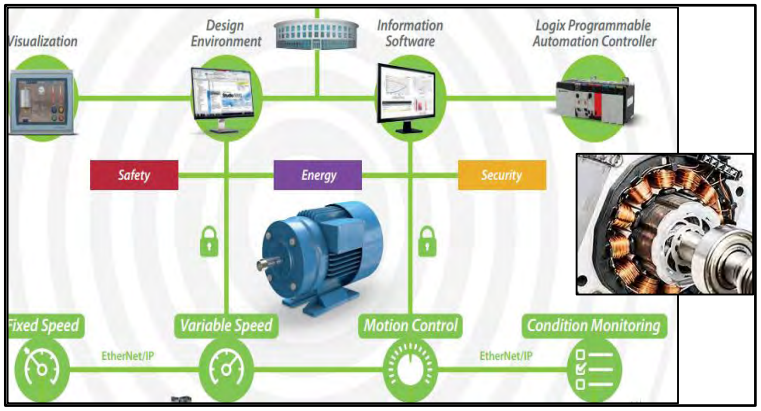
High Energy Density Batteries

Potential Applications in the Energy Sector

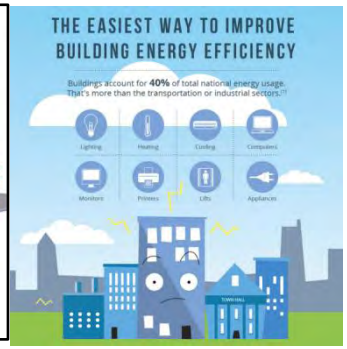
➢ INDUSTRY, COMMERCIAL AND RESIDENTIAL ENERGY USE



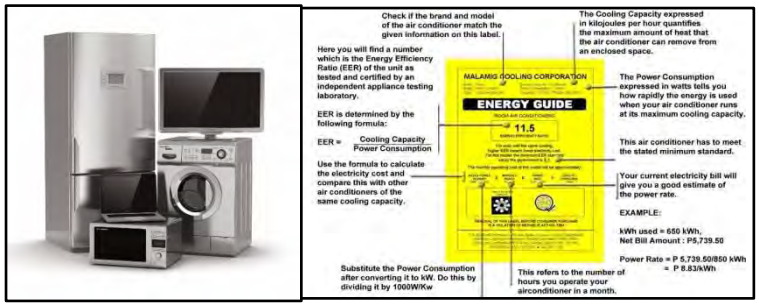
Tri-generation System



Efficient Motors and Intelligent Drive Control



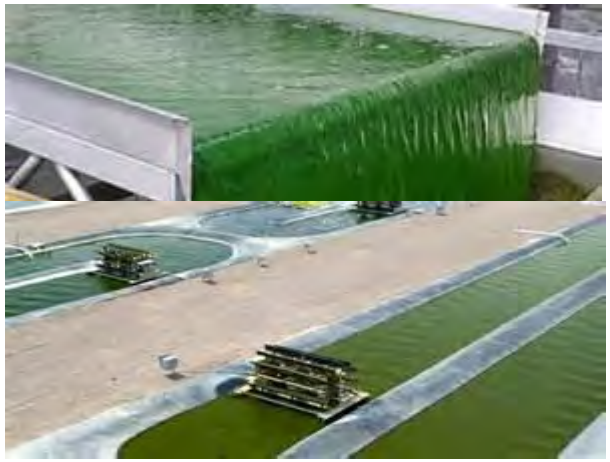
Smart Homes & Buildings



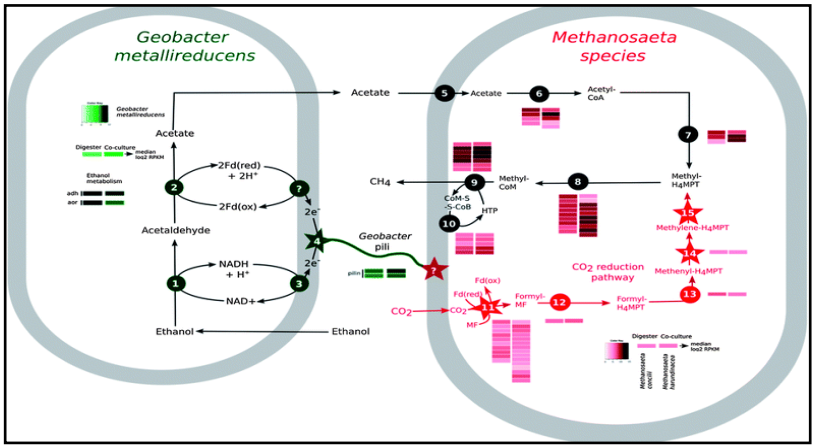
Energy Efficient Appliances

Potential Applications in the Energy Sector

➢ ALTERNATIVE ENERGY PRODUCTION (Bio-Mimicking)

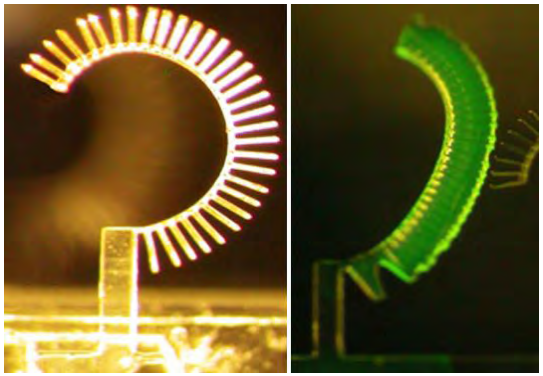


Ethanol Production from Micro-algae



Direct Electricity Production from methane cellular organism

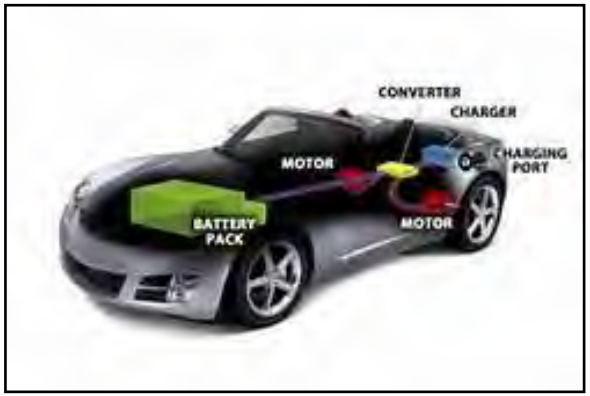
Solar Cell Layout based on Vine-leaf arrangement



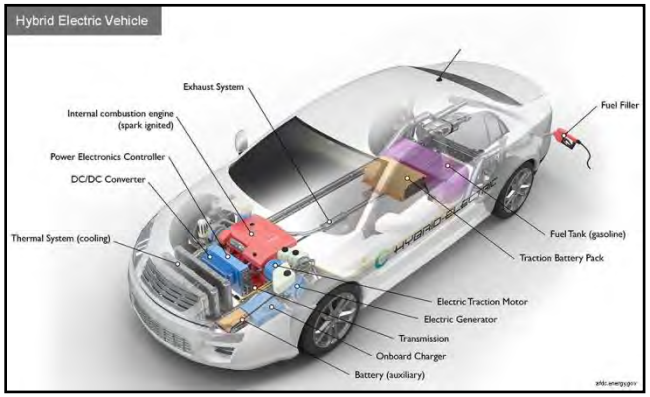
FERN POWER

Potential Applications in the Energy Sector

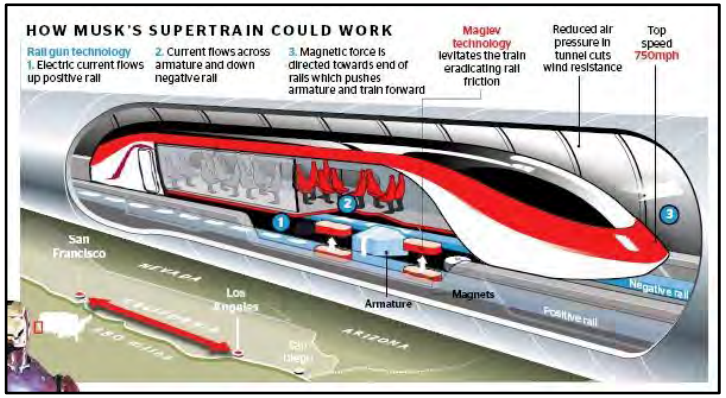
➢ NEXT GENERATION TRANSPORTATION TECHNOLOGIES



E-Vehicles



Hybrids



Rail-Gun Train

WalkCar Personal transport

STEPO Personal transport-G

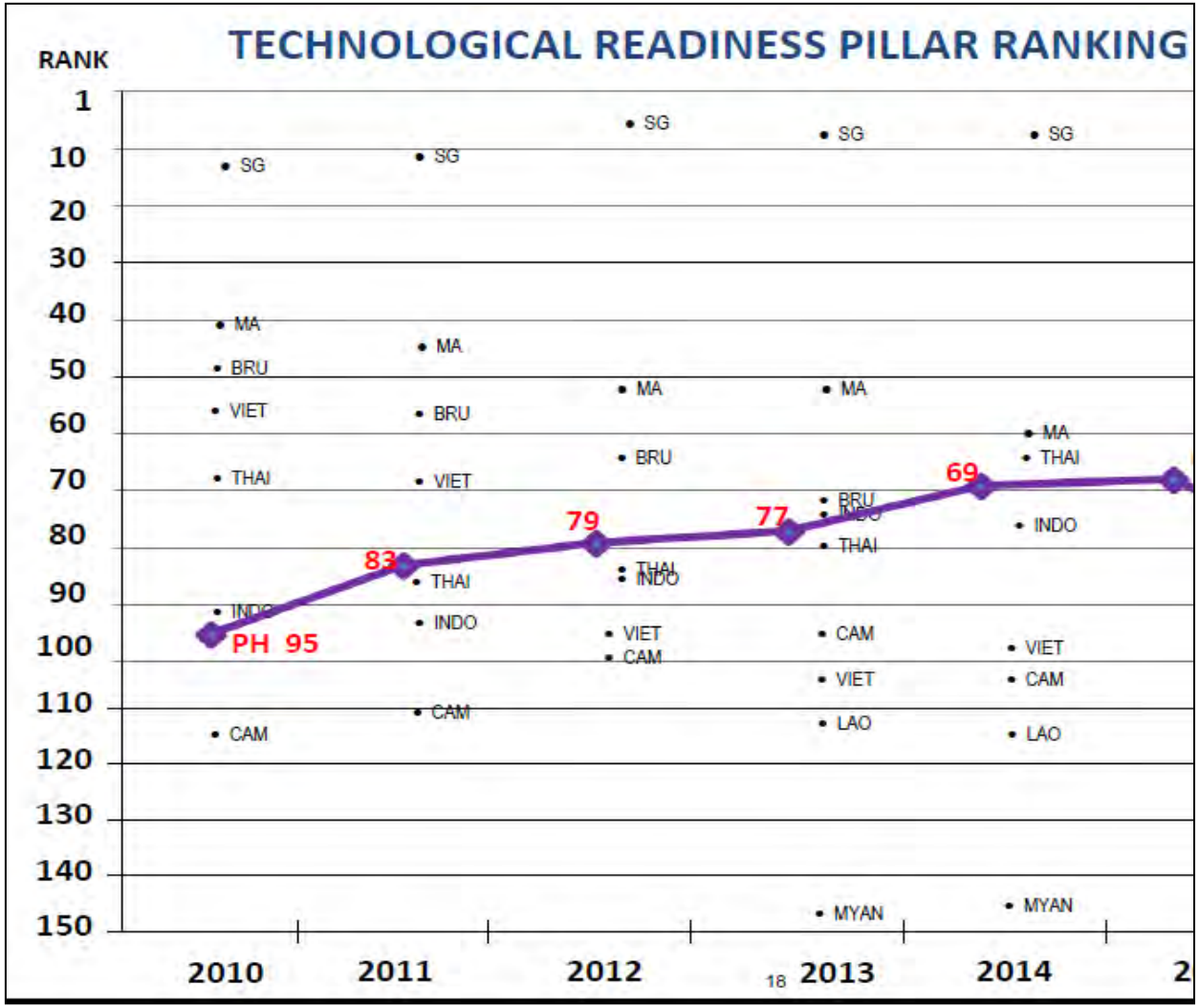
New concepts in Transportation Technology

Innovation and Emerging Energy Technologies

Philippine Science and Technology System Structure

ENERGY UTILIZATION MANAGEMENT BUREAU

Philippine Global Ranking



Philippine Global Ranking

Indicator	2011-2012	2012-2013	2013-2014	2014-2015
Technological Readiness	**83/142***	**79/144***	**77/148***	**69/144***
1) Availability of latest technologies	62/142 (5.2)	56/144 (5.2)	47/148 (5.3)	58/144 (5.1)

- Executive Opinion Survey with question asked: *"To what extent are the latest technolo country?"*
- Experts ranked 1 to 7 according to their perception on availability of technology giving a 7 as widely available

2) Firm-level technology absorption	52/142 (5.1)	46/144 (5.2)	40/148 (5.2)	41/144 (5.1)

- Executive Opinion Survey with question asked: *"To what extent do businesses in your c technology?"*
- Experts ranked the country from 1 to 7 with 1 as lowest or firm not absorbing technolog aggressively absorbing technology

3) FDI and technology transfer	66/142 (4.7)	40/144 (5.0)	42/148 (4.9)	31/144 (5.0)

Innovation and Emerging Energy Technologies

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MOA on STEA

PCIEERD
Philippine Council for Industry, Energy and Emerging Technology Research and Development

Energy Research & Capacity Building

STATE UNIVERSITIE S AND COLLEGES

Collaborative Undertaking/ Technology Validation

ENERGY UTILIZATION MANAGEMENT BUREAU

ALTERNATIVE FUELS AND ENERGY TECHNOLOGY DIVISION

FORMULATES POLICIES, PLANS AND PROGRAMS RELATED TO NEW AND ADVANCED ENERGY TECHNOLOGIES (NAETs) AND ALTERNATIVE FUELS DEVELOPMENT TOWARDS A SOCIALLY AND ENVIRONMENTALLY RESPONSIVE AND EFFECTIVE UTILIZATION OF ENERGY RESOURCES

- ALTERNATIVE FUELS AND ENERGY TECHNOLOGY EVALUATION AND PROMOTION
- ALTERNATIVE FUELS AND ENERGY TECHNOLOGY PROGRAM DEVELOPMENT AND MANAGEMENT

- ITDI — Industrial Technology Development Institute
- MIRDC — Metals Industry Research and Development Center
- PNRI — Philippine Nuclear Research Institute
- PSHSS — Philippine Science High School System
- SEI — Science Education Institute
- STII — Science and Technology Information Institute
- TAPI — Technology Application and Promotion Institute

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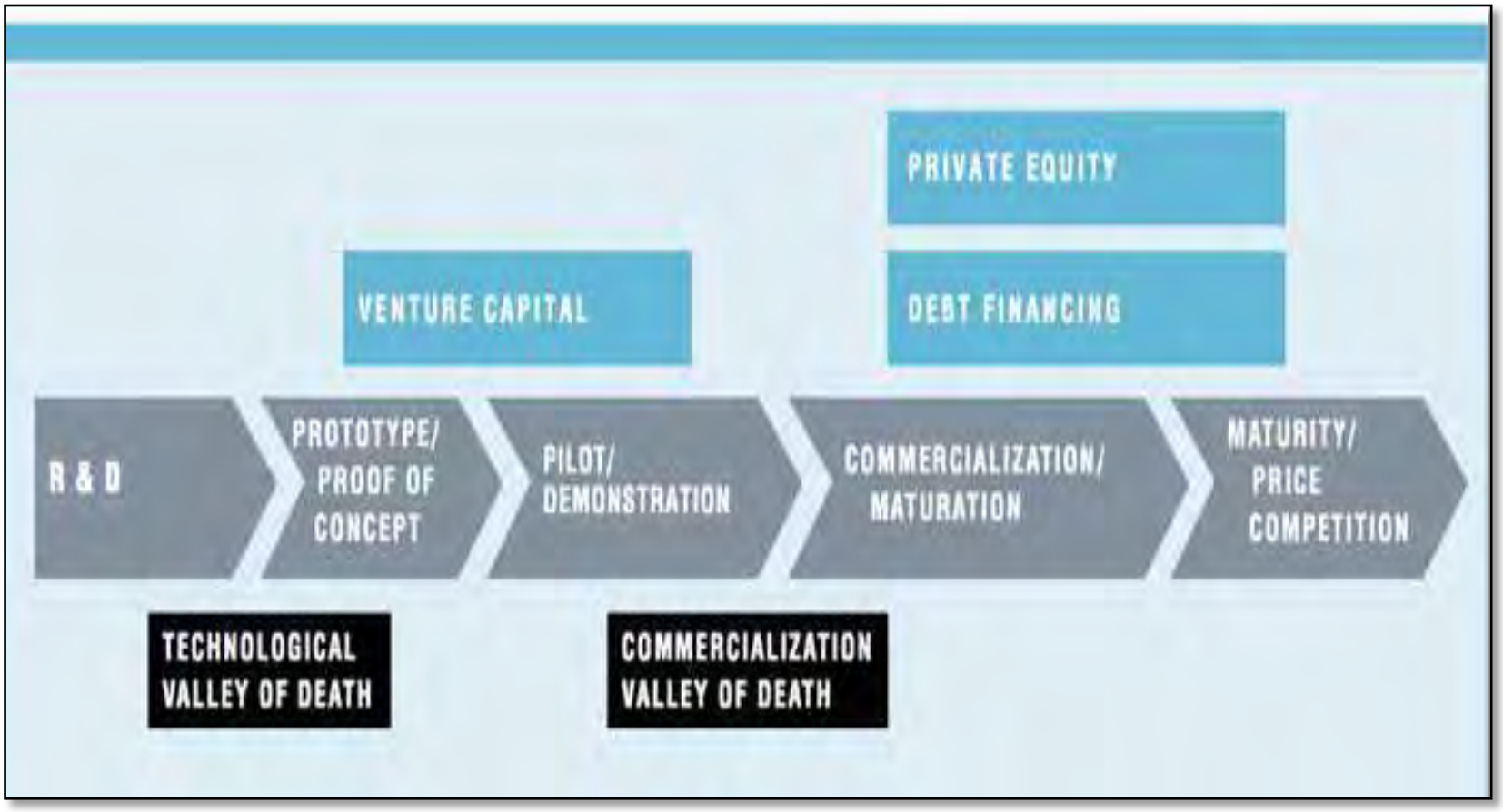
Innovation and Emerging Energy Technologies

New Technology's Valley of Death



Carnegie Mellon University
Scott Institute
for Energy Innovation

TECHNOLOGY GUIDE

New Technology's Valley of Death

Technology Evaluation for 2017
Local Concept for Energy Innovation and Technologies
(In coordination with TAPI and PCIEERD)

1. *Independent Power Generation (IPG)*
2. *Drive-in Electric Turbine (DIET)*
3. *Air Hydro Power Plant*
4. *Modular Hydrogen Generation System*
5. *Alternative Synchronous Electric Motor and Generator Energy Device*

All Concepts did not passed the Valley of Death due to lack of sound scientific basis

Innovation and Emerging Energy Technologies

On-Going Programs

Commercial/Industrial Sector

Transport Sector

- Prototyping of Original Equipment Manufactured (OEM) and Philippine National Standards (PNS) compliant AutoLPG Jeepney
- Tricycle Modernization Program

Non-Biomass based waste-to-energy generation

- Collaboration with international technology provider for pilot technology demonstration

Household Sector

Non-wood based fuel for domestic cooking

- Collaboration with Central Mindanao University for the identification and characterization of grass-based fuel for use in domestic cook stove

Agriculture

- Collaboration with Isabela State University for the prototyping and demonstration on the use of LPG in agricultural machineries

Technologies lined-up for research

Human Kinetic Energy Harvesting
Micro-Energy Harvesting
Enzymes for ethanol production from biomass
Universally-compatible EV Quick Charging Station

The Push for Local and Indigenous Energy innovation

The Push for Local and Indigenous Energy innovation

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Thank You!

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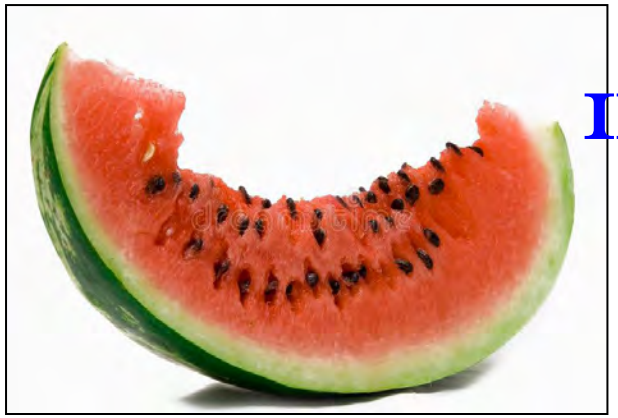
The way to innovative thinking

WHAT'S THE PROBLEM...

CREATED

TOO MANY SEEDS

SEEDLESS VARIETY



IMPROVED

UN-APPEALING

ARTISTIC DESIGN

The way to innovative thinking

INNOVATE

INCONVENIENCE IN HANDLING

STABLE GEOMETRIC SHAPE

The way to innovative thinking