


RET Safety in APEC

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Department of Alternative Energy Development and Efficiency
MINISTRY OF ENERGY

The Alternative Energy Development Plan is the current roadmap for renewable energy development targets

Foundation: Commitment to the development of a low-carbon society

Facilitator: *Private-led investment*

Strategy: Alternative Energy Development Plan 2012-2021

Facilitator: *Government funded RD&D*

Goal: Target 25% renewables in Total Energy Consumption by 2021

Bio-Energy

Biomass	Biogas	MSW
4,800 MW	3,600 MW	400 MW
8,500 ktoe	1,000 ktoe	200 ktoe

8,800 MW Power | 9,700 Ktoe Heat

Bio-Fuel

Ethanol	Biodiesel	2nd Gen.
9 ML/Day	~7 ML/Day	3 ML/Day

Solar

3,000 MW

100 Ktoe

Wind

1,800 MW

4,800 MW Power | 100 Ktoe Heat

Hydro

Mini (<1 MW)	Micro (<100 kW)

324 MW

New-Energy

Tidal Wave	Geothermal
2 MW	1 MW

3 MW

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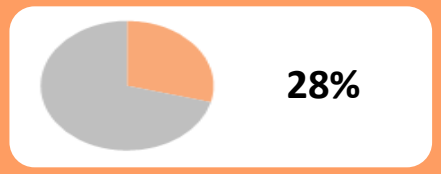
Progress towards 2021 AEDP goals varies significantly by energy source

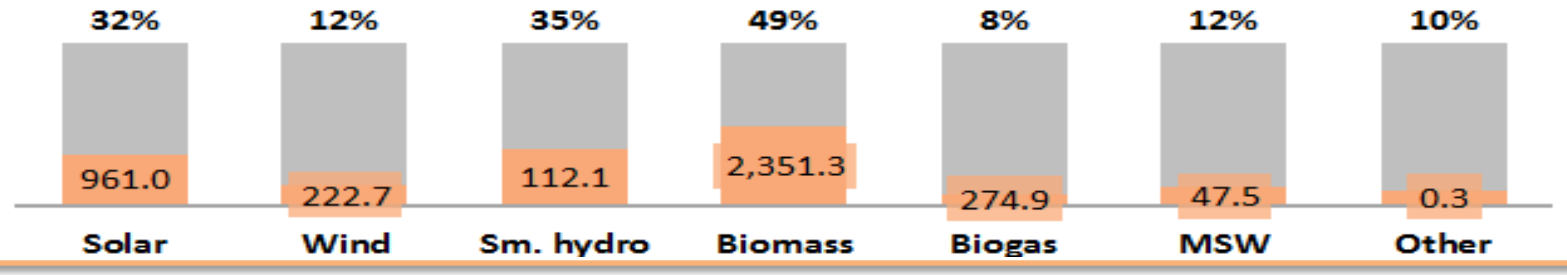
Renewable Electricity



28%

3,969 MW / 13,927 MW

Development progress, MW and % target

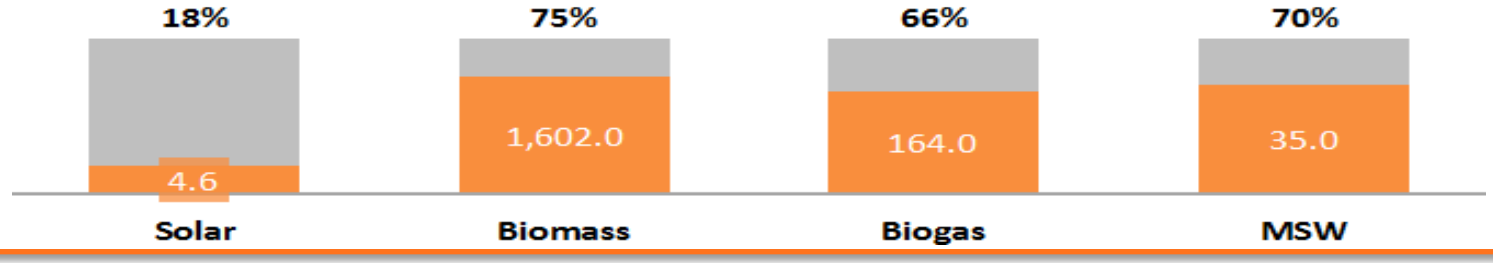


Renewable Heat

55%

1,345 ktoe / 2,450 ktoe[1]

Development progress, ktoe and % target[1]

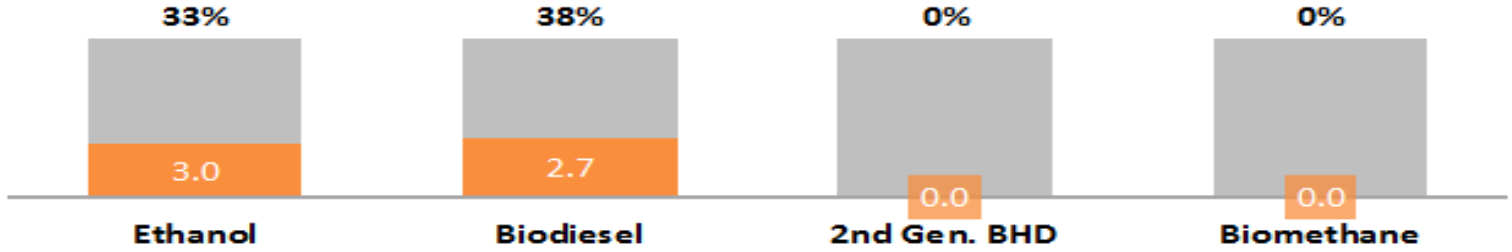


Biofuels

31%

5.9 ML/day / 19.2 ML/day

Development progress, ML/day and % target

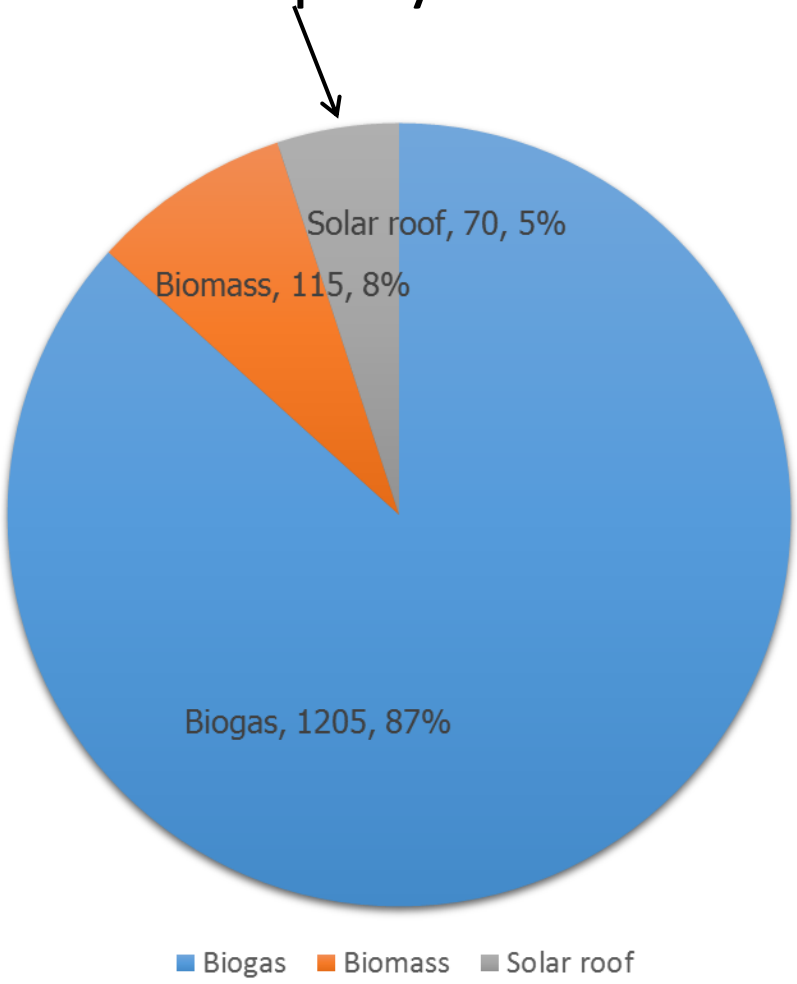


1 Note that the full year target is 9,800 ktoe; this is a prorated target for Q1

SOURCE: Energy in Thailand – Facts and Figures

Renewable energy sites in Thailand

Trend to rapidly increase



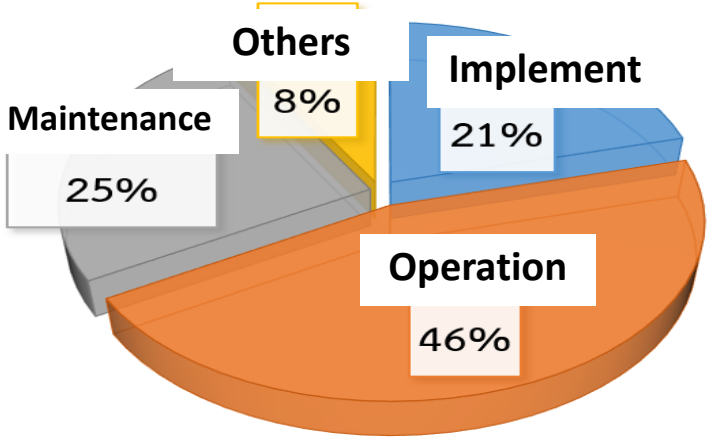
- Most popular Renewable Energy Technologies in Thailand are Biogas reactor, Biomass gasification, and Solar PV.
- The figures presented are large sites.
- There are more for smaller size, which popularly located in communities.

RE safety issue (Record from International experiences)

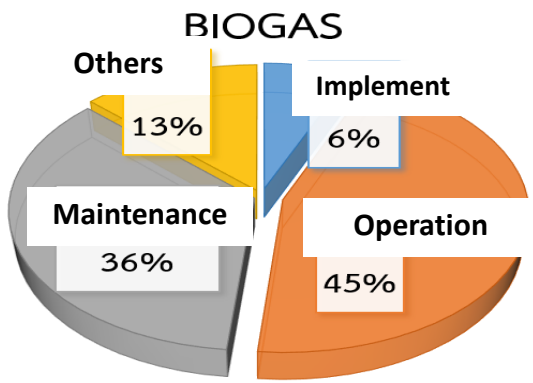
48 cases (rooftop 11, biomass 6 , biogas 31)

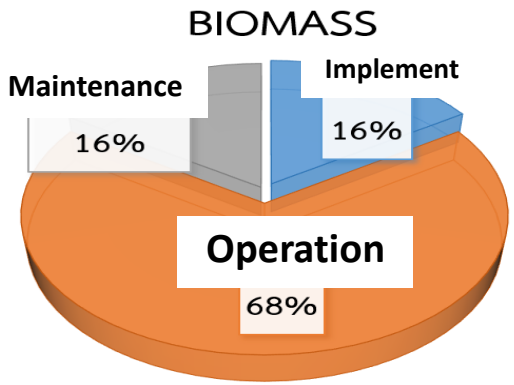
wound 113 people: Dead 140 lifes Casulties 138,300,000 THB (4.6 Million USD)

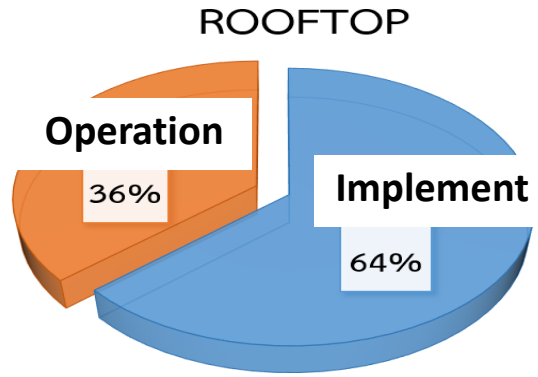
Biogas+Biomass+Rooftop



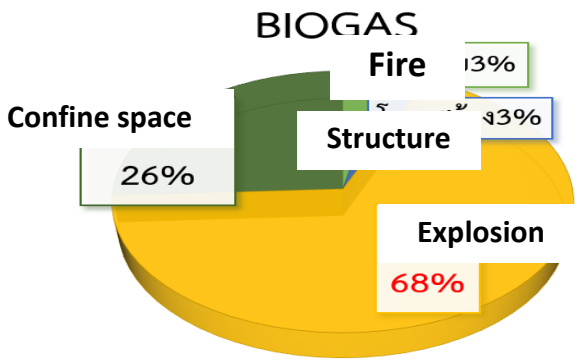
Accident by procedures

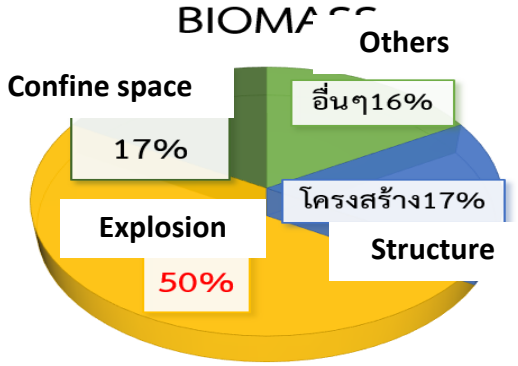


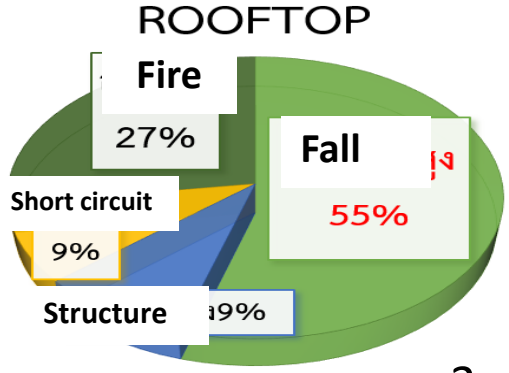




Accident by causes







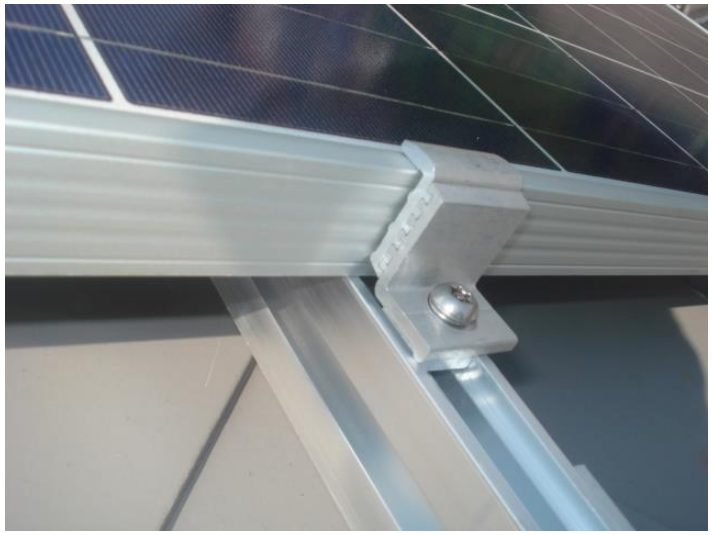
RET and accidents in Thailand

- More that 80% of accident are from Biogas technology
- Approximately 90% of casualties and deaths occurred with workers
- 30% of casualties and deaths are workers from Myanmar and Laos
- Although trainings are regularly provided, but only engineers and safety personals attend (not workers)
- Training materials are too difficult to understand to workers
- Solar PV rooftop accident is only 1, and we intend to keep it that way.

The PV case in Thailand

- Date : April 8, 2013
- Due to battery explosion on a very hot day (Ambient air is about 40 C)
- Selection of equipment was not appropriated – use car-type battery with no overcharging equipment
- House was totally damaged but luckily no casualty

Community scale PV site installation



Good and bad example

Biogas technology

Date : May 27, 2012

Danger?

Very very much indeed

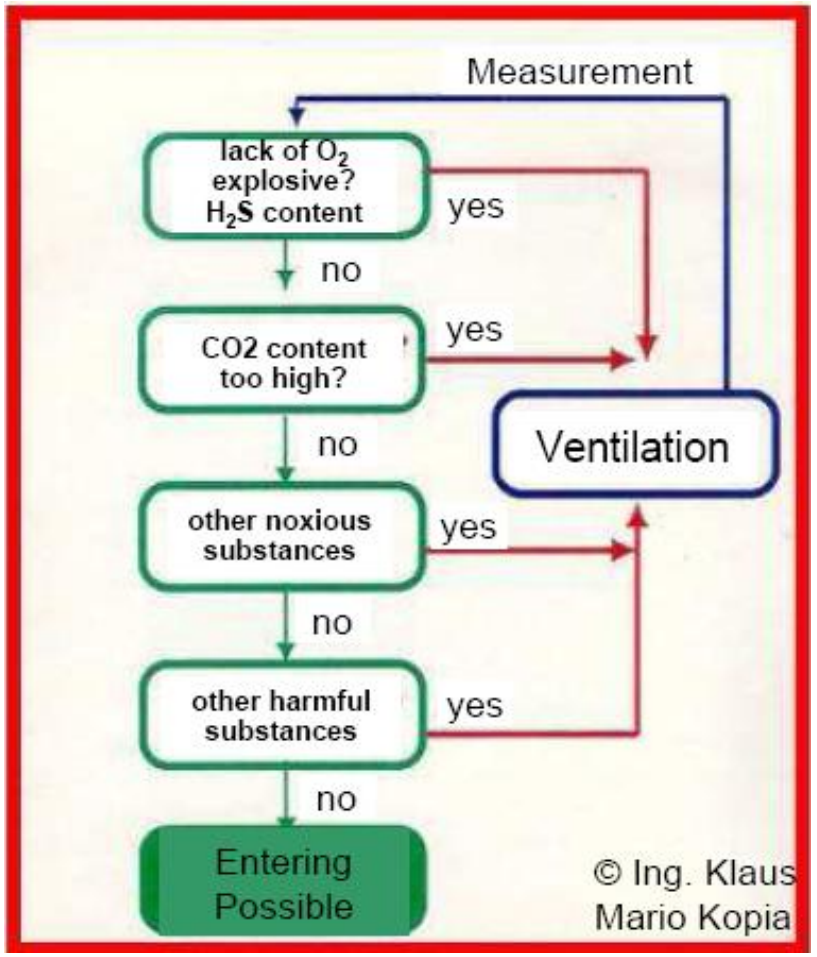
Maintenance period:

Pumping work without checking the air content
In the small pond. → Short circuit → lack of air
(confine space) → 5 people dead
(1 vet, 2 Thai workers, 2 Burmeses)

TV News

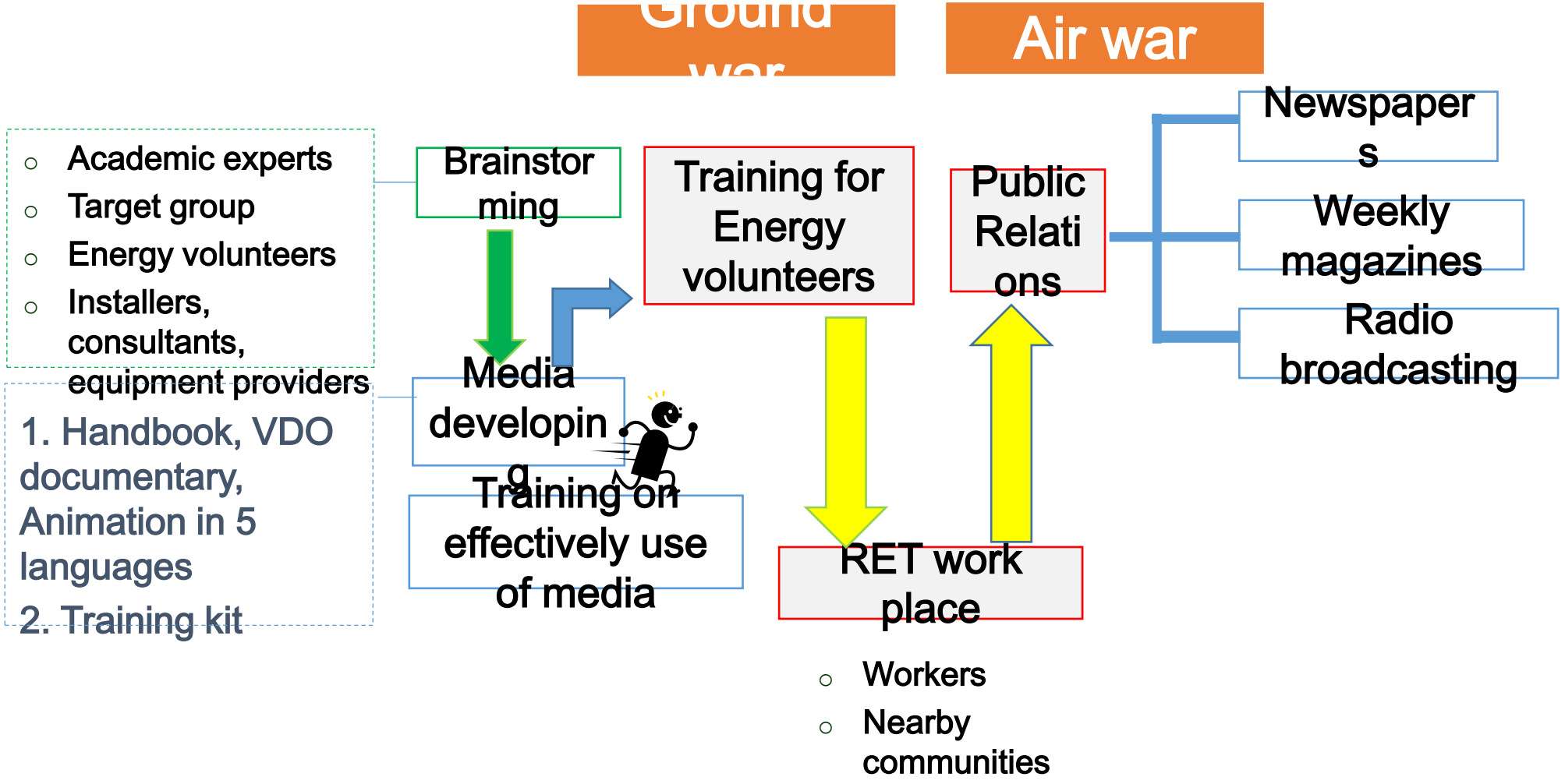
Simple measure to prevent accidents

Right procedures + Right equipment => Right people



Warning signs

Processes to send message to intended persons



Demonstration kit + Training

The kit

Ready

Training

Objective

- We do not want other economies to learn this a hard way.
- Focus mainly to worker level, under the standard work of each country

RETs

- Biogas, Biomass, Solar PV

Target economies

- 4 : Vietnam, the Philippines, Malaysia and Indonesia

Safety promotion and constrains

- Safety in operation of Renewable Energy Technologies is important.
- Awareness raising is as essential as promoting RET
- Regular methods for promoting RET safety may not effective since they may hinder the RET promotion
- Balance is need (Aware and Alert but not Scared)
- Materials in local languages are also needed
- Technical knowledge must be simplified so that general people can understand quickly

Our strategy

	Preparing Troops and Arsenals	Developing strategy
3 months	Preparing materials 1. Develop Handbook, VDO documentary, Animation in local languages 2. Prepare Training Kit based on local materials	Strategic planning 1. Coordinate with partners to formulate strategies to use training materials and personals (For example ground-war + air-war strategy) 2. Preparing action plans
6 months	Selection of training personal Coordinate with partners in targeted countries to select 30 suitable local people for training	
3 months	Provide training Building capacity in using provided materials with the right communication skills to attendees	

Proposing APEC economy: Thailand
Co-sponsoring: Seeking
Expecting date: Feb 1, 2015-Jan 31, 2016 (one year)

Budget

- Traveling USD 25,000 (4 seminars in 4 countries)
- Labor cost USD 30,000 (6 man-month)
- Hosting USD 23,000 (4 seminars)
- Public & distribution USD 30,000 (4 seminars)
- Other USD 12,000 (10% university overhead)
- Total USD 120,000

Project Overseer Information and Declaration:

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Thank you

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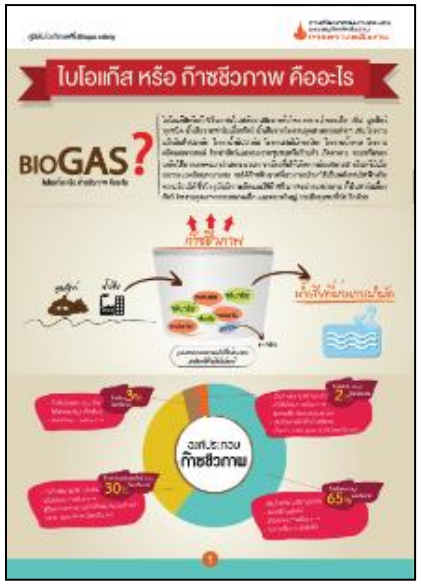
Media


คู่มือ
ไบโอแก๊ส เซฟตี้
BIOGAS
Safety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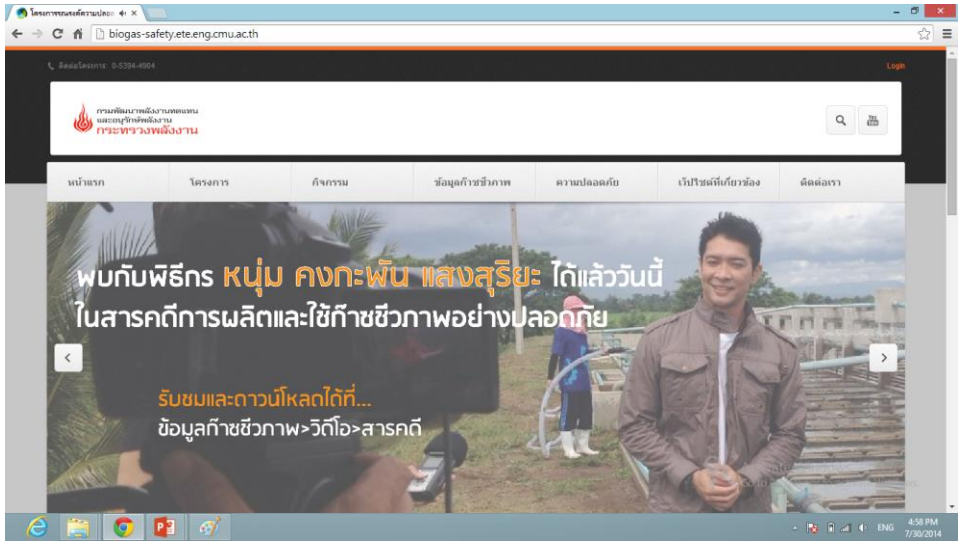
BIOGAS?


biogas-safety.ete.eng.cmu.ac.th
กระทรวงพลังงาน
หน้าแรก
โครงการ
กิจกรรม
ข้อมูลก๊าซชีวภาพ
ความปลอดภัย
เว็บไซต์ที่เกี่ยวข้อง
ติดต่อเรา
พบกับพิธีกร หนุ่ม คงกะพัน แสงสุริยะ ได้แล้ววันนี้
ในสารคดีการผลิตและใช้ก๊าซชีวภาพอย่างปลอดภัย
รับชมและดาวน์โหลดได้ที่...
ข้อมูลก๊าซชีวภาพ>วิดีโอ>สารคดี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BIOGAS
Safety
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