Presented By

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APEC Policy Partnership on Food Security (PPFS) was established in 2011 for strengthening public-private cooperation to address food security issues in the region.
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About APEC PPFS

• PPFS is established to develop policies and solutions for food security in the Asia Pacific region

• APEC economies have given high priority to the issue of food security and has built a solid foundation for agriculture, aquaculture, fishery, food exchange and cooperation under various multilateral and bilateral frameworks

• PPFS to achieve these food security goals in the region
About APEC - Facts

• Asia-Pacific accounts for half of the world's cereal production and over 40% of its trade volume, production growth depends on expanding cultivable areas and continue enjoying favourable weather conditions.

• APEC members account for over 80 percent of global aquaculture production and more than 65 percent of the world’s capture fisheries
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About APEC - Facts

- APEC comprises 9 of the 10 top fish producers in the world.

- Aquaculture is now one of the fastest growing food-producing sector which now accounts for almost 50% of global food fish

- PPFS Working Group One (WG1) – Sustainable Development in Agriculture & Fishery Sectors
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Mission of PPFS Working Group One

• Commitment to pursue sustainable development by promoting R&D and technology dissemination

• Protecting our farmers from current and future negative impacts of climate change

• Providing training on sustainable management in the use of natural resources and promoting consumption of sustainably produced food.
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Mission of PPFS Working Group One

• Integration and Sharing of Agriculture & Aquaculture technologies, resources and expertise within the APEC Ecosystem

• NTU APEC Centre for Sustainable Development in Agriculture and Fishery Sectors was setup in Singapore to support the initiative of PPFS WG1
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Identified Areas of Resources

• Infrastructure and Manpower
• Technology and Training
  • Use of Clean and Renewal Energy
• Processing and Trading
• Funding
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• Desired Outcome
  • Transfer of Technologies for Sustainable Farming amongst APEC economies
  • Creation of jobs
  • Contract farming within APEC Ecosystem
  • Enhanced Food Security
Current Collaborations in Progress

• Currently, we have a total 9 ongoing projects and 2 projects in discussion
• Projects are mostly between private sectors involving 5 countries
  • Singapore, Malaysia, Indonesia, China and Philippines
  • All projects are technology related and 4 are clean & renewal energy related
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About the Centre

• APEC Centre for Sustainable Development in Agriculture and Fishery sectors was setup in August 2016

• Joint effort with Nanyang Technological University

• Clean Energy Partner- Energy Research Institute @ NTU - ERI@N
Energy Smart, Research Innovation.

Flagships: EcoCampus & REIDS

- Sustainable Building Technologies
- Renewable Energy Storage & Fuel Cells
- Renewables - components, grid integration
- Multi-Energy Systems & Smart Grids
- Autonomous Vehicles & Electromobility
- Maritime Clean Energy

Materials, Sim. & Modeling, Electrical Power / Control, Reliability

Colleges of Sciences, Engineering, Humanities, Arts, & Business
Renewable Energy Integration Demonstrator – Singapore (REIDS)

RD&D at a large-scale - proper integration of a broad range of renewable energy production - onshore and offshore, energy storage and rational energy end-use technologies

Offshore test site #1 - Tidal Test Range

Power Consumption
Daytime Peak Load: 400kW
Nighttime Peak Load: 200kW
More loads are expected up to MW scale
NanoGrid & Energy Storage

**Renewable Generation**
- Selection and sizing of technologies based on in situ resource assessment and assurance of generation adequacy
- Combination of technologies for improved capacity factor and availability factor

**Energy Storage Technologies**
- Selection and sizing of technologies based on capacity factor, generation profile, load profile and load requirements
- Combination of technologies for system optimization, improved power quality, reliability/security

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**NanoGrid Controller**

- Solar PV (0.5-10 kW)
- Wind Turbines/ Wind Energy Harvesters (0.5-10 kW)
- Tidal & Water Turbines, Wave Energy Harvesters (5-10 kW)

**Energy Storage Technologies**
- Super Cap
- Fuel Cell Energy Storage (5-10 kW)
- Battery Bank
- Compressed Air Energy Storage (10 kW)
Role of the Centre

• Provide a Model for member countries to setup Technology Resource Centre (TRC) in their country to facilitate transfer of technologies, incubation of technologies etc
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• Role of the Centre
  • Platform for R&D and technology Dissemination in APEC PPFS for both small stake holders, SME and big companies
  • Facilitation platform for Public Private sector collaboration
  • Traction point for identifications of sustainable technologies from various APEC economies
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• Role of the Centre
  • Incubation and rollout of promising technologies
  • Develop and support the WG1 initiative and long term plan for Sustainable Food Production
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• Work programme for 2016 - 2017
  • Connect WG1 to global aquaculture & agriculture institutions/ bodies for exchange of ideas, best practices, and technologies exchange
    • Global Aquaculture Alliance – GAA
    • World Aquaculture Society – WAS
    • MSC – Marine Stewardship Council
    • Japan Plant Factory Association
    • Others
Work programme for 2016 - 2017

• Round Table Engagement with Major feed producers and Feed additive producers in Singapore & Europe
• Climate Smart Agriculture Initiative
  • Inland Vegetable Farming
  • CSA Green house – Use of Anti Thermal Coating
  • CSA Soil moisture Management
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• **Work programme for 2016 - 2017**
  • Agriculture & Aquaculture farm that is powered entirely by renewable energy
    • In current discussion with Solar Development & Leasing companies in the region
  • Farmers pay zero dollar for Solar energy infrastructure setup
  • Farmer only pays for usage of energy (Kilowatt)
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Use of Renewal Energy for Climate Smart Farming
The Future

Land Based Agriculture and Aquaculture Farm
Powered entirely by Renewal Energy
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Thank You