



# DOST R&D Program on Energy Storage

Hotel H2O  
Luneta, Manila  
15 March 2016

Engr. Patrick E. Montero  
Senior Science Research Specialist  
DOST-PCIEERD

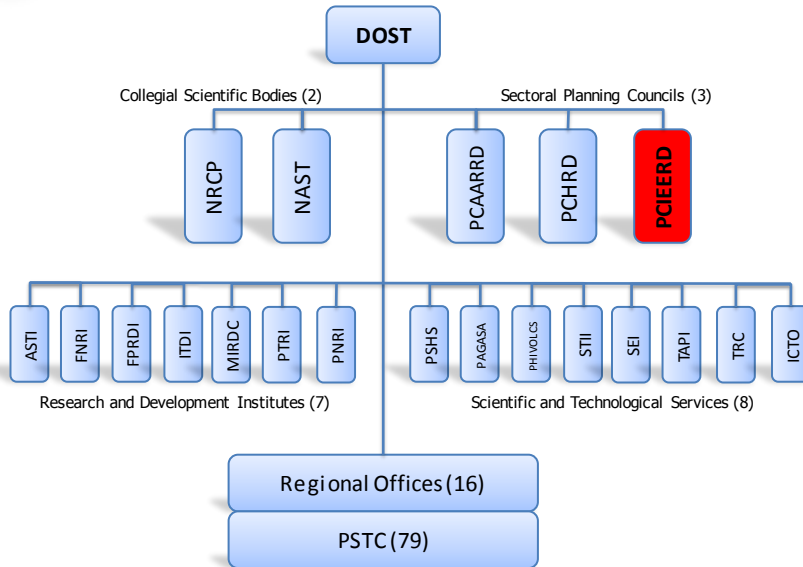


## Outline

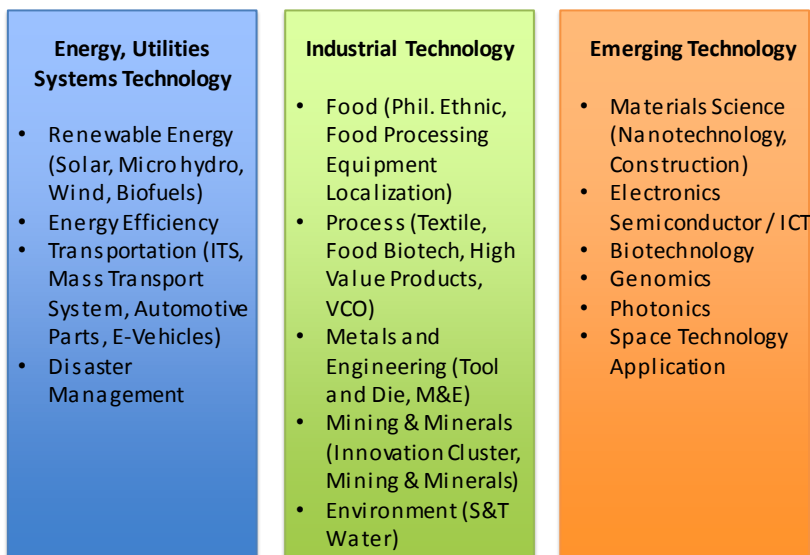
- About DOST-PCIEERD
- R&D Initiatives on Energy Storage
  - Roadmap
  - Current R&D undertakings
- Reactions



## DOST Organizational Structure



## PCIEERD Sectoral Concerns

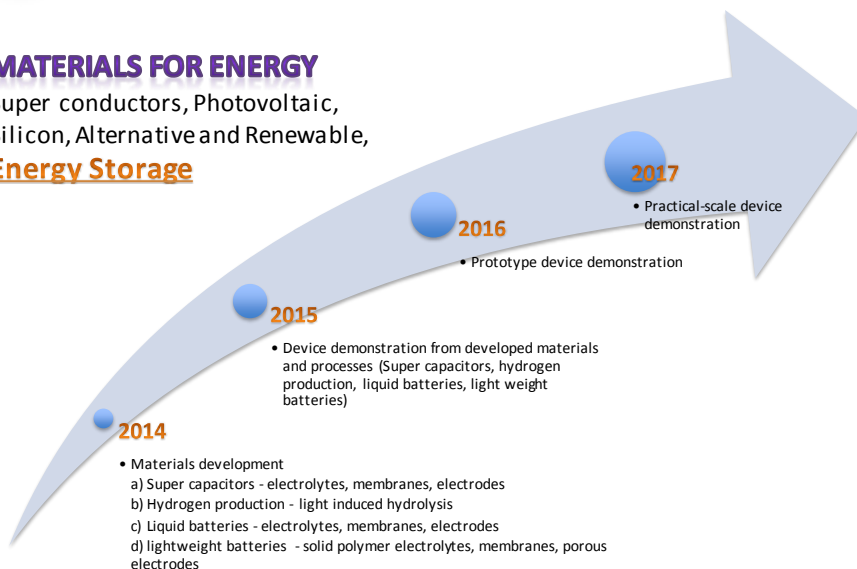




## R&D Roadmap for Energy Storage

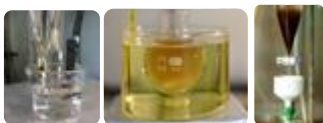
### MATERIALS FOR ENERGY

Super conductors, Photovoltaic,  
Silicon, Alternative and Renewable,  
Energy Storage



## Current R&D Undertakings

### FLEXIBLE NANOHYBRID SUPERCAPACITOR BASED ON CONDUCTING POLYMERS AND METAL OXIDES – UP Diliman



Preparation of Electrode Materials using Electrochemical and chemical synthesis



Flexible Supercapacitor device

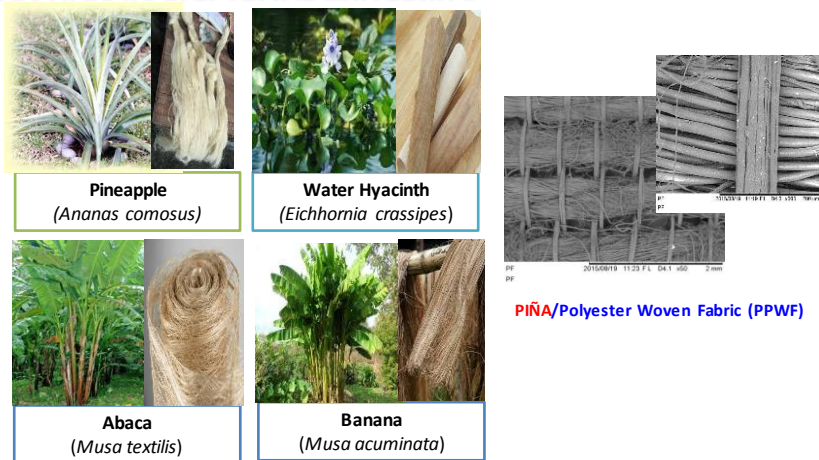


Supercapacitors in series connection using ePPy-MnO<sub>2</sub> electrodes



## Current R&D Undertakings

### FABRICATION OF SUPERCAPACITORS USING INDIGENOUS TEXTILES AS ELECTRODE MATERIALS – UST



## Current R&D Undertakings

### FABRICATION OF A SOLID-STATE RECHARGEABLE LITHIUM-ION BATTERY USING $\text{Li}_7\text{La}_2\text{Zr}_2\text{O}_{12}$ AS SOLID ELECTROLYTE FOR ENERGY STORAGE APPLICATIONS – UP Diliman





## Reactions

- Supply chain for outsourcing vanadium electrolytes and cell stacks
- Price competitiveness compared to other battery technologies
- Research opportunities to increase volumetric energy storage capacities
- Pilot demonstration of Vanadium RF battery



**Dr. Carlos Primo C. David**

Executive Director

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

Department of Science and Technology



Thank You.