Vietnam Clean Energy Program (VCEP)  
Creating the Capacity to Enable High Performance, Green Buildings
Key VCEP Program Activities

1. **Demonstration buildings: very energy-efficient & green:**
   1. Actual high, performance buildings
   2. Toward net zero energy buildings
   3. Within Green Growth Action Plan (for buildings and urban areas)

2. **Major training program:**
   1. Integrated design - raise level of awareness
   2. How to do high performance, low energy green buildings (30% to 50% savings)
   3. Energy Simulation Training - Intensive, hands-on training for up to 100 persons.

3. **First National database** on energy performance of buildings

4. **Disseminate project results widely**
   1. Project results on website within Ministry of Construction website.
   2. Key products in DropBox and Box folders
1\textsuperscript{st} Demonstration Building – Energy Training Center (ETC)
50% Energy Savings

\textit{Success Story #1}

\begin{figure}
\centering
\includegraphics[width=\textwidth]{chart}
\caption{Energy savings comparison}
\end{figure}

- LDP20: 368.76 MWh/year
- Baseline 2 LDP VEEBC: 302.35 MWh/year
- WWR 50% front: 290.73 MWh/year
- Double pane SHGC 0.44: 284.03 MWh/year
- Windows band (back) no shading: 288.95 MWh/year
- Add shading 3x20cm: 285.03 MWh/year
- ALC Brick: 282.75 MWh/year
- Heat recovery wheel: 278.90 MWh/year
- Setpoint 27\textdegree C: 260.32 MWh/year
- CO2 sensor: 244.00 MWh/year
- Natural Ventilation: 212.00 MWh/year
- Light dimmer: 184.37 MWh/year
- SHGC 0.26: 180.90 MWh/year
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2nd Demonstration Building – TTAS building
Also 50% Energy Savings *(from Energy Code)*
VCEP Training Program: *Success Story #2*

**Key Audiences for Capacity-Building:**

- Architects, Engineers, Construction Managers, Facility Managers, and Energy Service providers
- Investors/Developers, Building Owners, and Lenders
- MOC, DOCs, including public building owners/operators
VCEP Training Program

- Mobilizing local experts together with foreign experts
- Doing a strong train-the-trainer program
- Established a network of professional and educational institutions as training partners
  - Vietnam Institute of Architecture,
  - Ha Noi University of Architecture,
  - Ho Chi Minh University of Architecture,
  - National University of Civil Engineering
  - VISRAE
- Introduced advanced energy simulation tools. 10-day hands-on. 100+ trained.
- Seminars in major cities. 1600+ trained.
VCEP Training Program: 3 Study Tours to US

- 1st study tour was in Nov 2014
  - 7 delegates
  - 4 cities
  - Policy meetings
  - Successful programs
  - Low energy and green buildings

- 2nd study tour was in July 2015
  - 8 delegates
  - 3 cities
  - Policy meetings
  - Focus on owners and designers of low energy and green buildings

- 3rd study tour is planned for fall of 2016
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National Database of Building Energy Use
Success Story #3

1. Needs Assessment and Plan
2. Building Stock:
   – Identify number of large buildings in last 10 years
   – 5 large cities in 3 climate regions
3. First Statistically Valid National Database:
   – Collection by consultants based on competitive RFPs
   – Collect detailed data – walk thru energy audit
   – 280 buildings in 15 building types in 3 climate regions
4. Develop online database for ongoing entry of data on buildings
   – Dual language
   – USDOE’s SEED program proposed as template
   – First for a few cities, Ultimately for all 63 provinces in Vietnam
To date we can estimate that about 120 large buildings are built each year in the five largest cities in Vietnam.
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Stock (quantity) of large buildings (TFA over 2,500m²) in biggest cities
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Stock of large buildings with TFA from 2,500m²
HANOI CITY, 2015

- BC01 Government office, central: 3%
- BC02 Government office, local: 0%
- BC03 Office building, Grade A: 7%
- BC04 Office building, Grade B: 9%
- BC05 Hotel, 4* or 5*: 1%
- BC06 Hotel, 3*: 1%
- BC07 Hospital, central: 3%
- BC08 Hospital, local: 0%
- BC09 Clinics: 0%
- BC10 Education, universities: 1%
- BC11 Education, classrooms: 2%
- BC12 Retail, large: 1%
- BC13 Retail, markets: 1%
- BC14 Residential: 2%
- BC15 Dormitory: 25%
- BC16 Complex: 42%
Average Energy Use Intensities of Buildings
Ho Chi Minh & Can Tho cities
(kWh/m².year)

- Hotel 4-5*, 206.5
- Hotel 3*, 78.1
- Retail, 298.8
- Complex, 185.7
- Residential, 59
Ability to do long term policy projections

CO2 emission reduction from energy building code compliance (tons of CO2)

- VEEBC 2013 Compliance
- VEEBC 2018 Compliance
- VEEBC 2023 Compliance
- VEEBC 2028 Compliance
- VEEBC 2033 Compliance
- VEEBC 2038 Compliance
VCEP Products onto Ministry of Construction’s Website
Thank You

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