

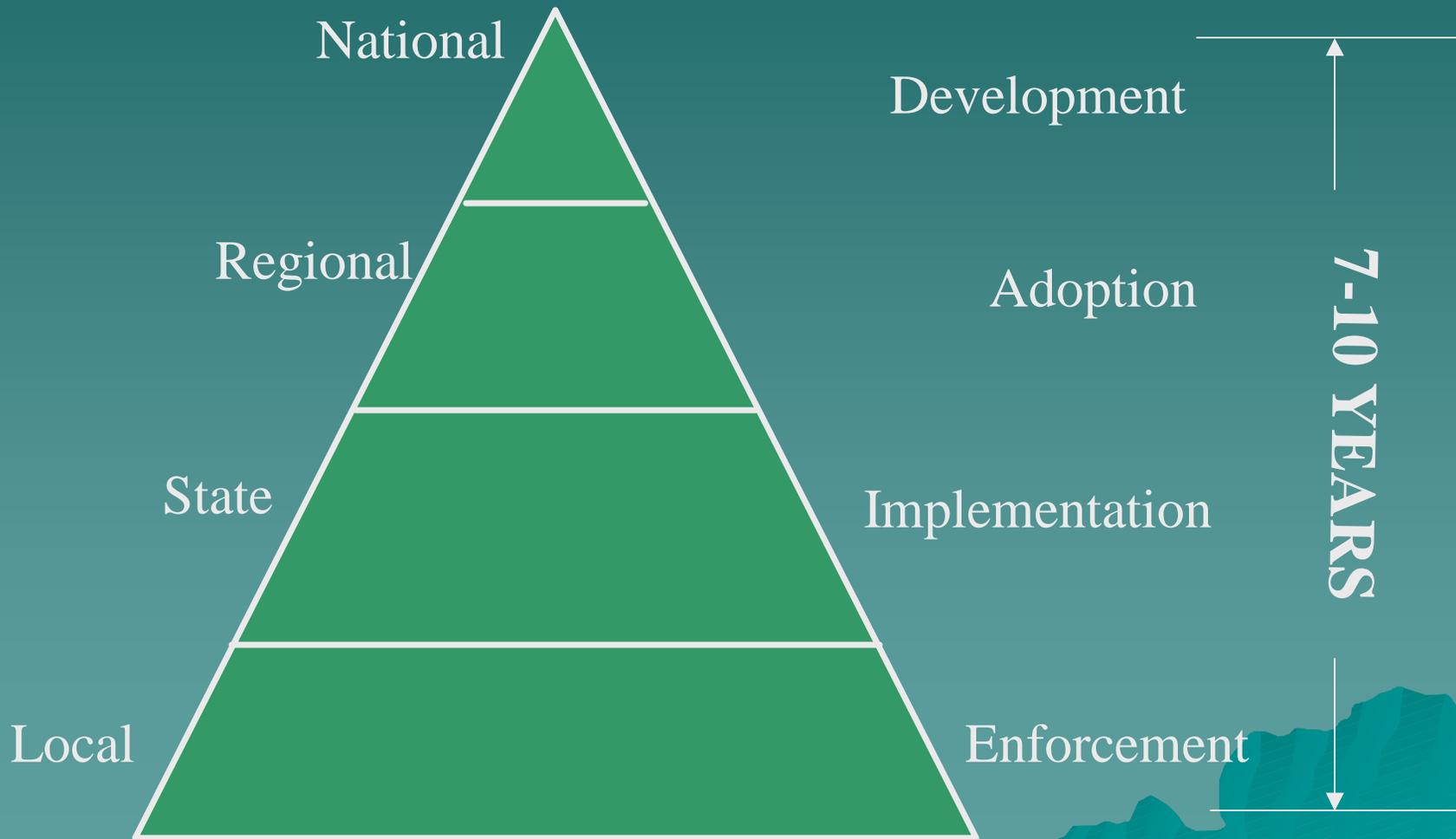
Regulatory Education and Outreach for Distributed Energy

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Distributed Power Program Review
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U.S. Building Standards and Model Codes



DOE Support of DER Codes & Standards

- Office of Distributed Energy Resources
 - Fuel Cells/BCHP, Ronald Fiskum, Tel: 202-586-9154, ronald.fiskum@ee.doe.gov
 - Microturbines, Debbie Haught, Tel: 202-586-2211
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 - Electrical Interconnection, State Education/Outreach
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Fuel Cells

- ANSI Z21.83/CSA 12.10, Fuel Cell Power Plants
- ASME PTC 50, Performance Test Code for Fuel Cell Power Plants
- IMC
- NFPA 70, Article 692, Fuel Cell Systems
- NFPA 853, Installing Fuel Cells
- NES Protocol

Microturbines

- UL 2200, Installation and Operation of Engine Generator Sets
- EGSA Performance Standard
- UC Irvine and California Energy Commission, MT Performance testing protocol

ALL DER

- IEEE P1547, Distributed Resources Interconnected with Electric Power Systems
- UL 1741, Static Inverters and Charge Controllers

"What's That?!"

-- Code inspector

Case Study – Capstone, Inc.

- Fargo, ND – Holiday Inn & Conference Center
 - 1 30-kW unit (M330-SA) with Unifin heat recovery system
 - Installed inside bldg., in mechanical room
 - Utilizes “low pressure” natural gas (11 lbs.)
 - No electrical interconnection with grid
 - Feeding all electrical and thermal output directly into boiler

Case Study – Capstone, cont.

<u>Action</u>	<u>Cost (\$000s)</u>
• Upgrade 50 yds. Natural gas pipeline (1 lb. To 11 lbs.)	4.0
• Mechanical inspector required:	
all pipeline connections to be welded	3.0
VF drive for additional combustion air into room	6.0
new chimney to outside	3.0
• Electrical inspector required:	
Grounding only	n/a
• Additional modem phone line	n/a
• Engineering labor and materials	14.0
Total Installation estimate:	30.0

Case Study – IdaTech, Inc.

- 2-5kW PEM fuel cell system and fuel reformer
- Utilizing methanol as feedstock on first units
- 300-gallon “toad” retrofitted as onsite storage tank, piping system
- Relevant code: NFPA 30 and 30A, Combustible Liquid Fuels
- One of first 10 units installed as part of BPA program, across the Pacific Northwest

IdaTech, cont.

- Fire Marshals in urban areas requiring the following on methanol systems:
 - Additional setbacks from walls, doors, windows, public access
 - Automatic shut-off valve during periods of no demand
 - Signage, fire extinguisher
 - Tank must be fenced, protected from vehicular impact
 - All pipes that enter building must be welded; all invisible joints must be welded

IdaTech, cont.

- Methanol fuel system requirements, cont:
 - 12-ft. ventilation stack
 - Emergency relief venting system – 18-in. manhole w/loose bolts
 - Seismic calculations
 - Secondary containment system
 - Sight glass on storage container
 - Static electricity management system – grounded tank, toad, etc.
 - Pressure test on all pipes and tanks, with Fire Marshall observing
 - Road uneven – must be re-graded

DER Road Shows

- One day, eight-hour session
- Purpose: to introduce local building and fire code inspectors to DER technologies with a “hands-on” experience
- Manufacturers present on their product, the installation/permitting process, with or without specific reference
- Alt. fuels and electrical interconnection may also be covered
- State PUC, energy office, and EPA regulators generally participate as well.
- **IMPORTANT** – Local regulators indicate which technologies, applications and fuel sources are of interest. Agenda is not fixed in advance.

DER Road Shows FY01

- California (San Diego, San Jose, Sacramento)
 - New York (Brooklyn, Long Island)
 - Nevada (Las Vegas)
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- A stylized silhouette of a mountain range in shades of teal, located at the bottom right of the slide.

DER Road Shows, FY02

- New York (Albany, completed Nov. 01)
- Wisconsin, Michigan
- Washington, Oregon
- Arizona, New Mexico, Texas
- Alaska, Hawaii
- Maine, Vermont

Training Materials

- Training “Modules”
 - Handbooks, videos, CDs
- State certification of inspectors
- Train-the-trainer programs

FERC/NERC Interactions

RTO/ISO Operators

State PUCs, PSCs, Energy Offices

State EPAs

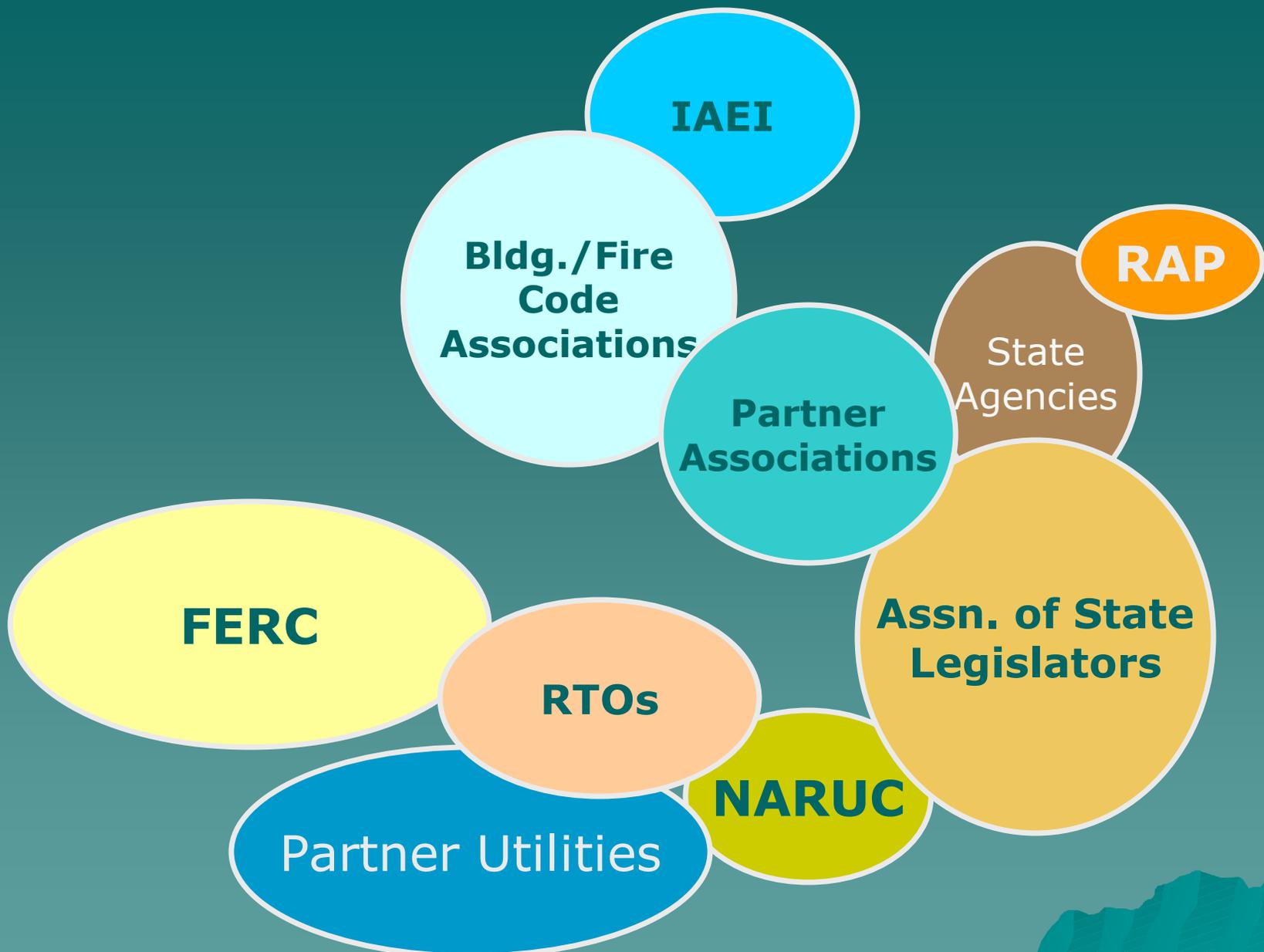
County Zoning and Planning Officials

Utility Interconnection Staff

**Municipal Building Code Authorities,
Fire Marshals**

Sample Topics

- RTO/ISO communications requirements
- Real-time pricing, demand markets
- IT: Substation automation, AMR, home gateways
- Management & valuation of intermittent resources (wind, PV)
- Contracting – capacity, energy, PF, ancillary svcs.
- Financing, insurance, liability assessment
- Environmental assessment, efficiency credits, arbitrage
- Utility interconnection
- Building and fire code development



Thank You

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