

Energy Assurance Support for Local Governments . . . funded by the US Department of Energy in partnership with NASEO, NCSL, NARUC, NGA, NLC, NACO & ICMA



Managed by Public Technology Institute... providing the benefits of technology to all local governments...

- Created in 1971
- Dedicated to furthering the use of technology in 33,000 units of local government in the US
- Takes policy direction from NLC, ICMA and NACO
- Undertakes applied research through pilot tests
- Has conducted research leading to over 300 publications
- Operates through its member-driven Councils: Public Safety and Homeland Security, Sustainability (energy and environment), CIO, and Transportation

Past issues & success stories...

- Aldo Leopold...ecology... Endangered Species Act;
Sand County Almanac, 1949
- Rachael Carson... pesticides (DDT)... led to creation of EPA;
Silent Spring, 1962
- Amory Lovins... changed the way we look at energy;
Soft Energy Paths, 1979
- 9/11... emergency planning and response...we can all be part of
the success story!

What drives local energy assurance planning?

- ...Federal Government: Local governments have considerable responsibilities in addressing the U. S. Department of Homeland Security's Emergency Support Function (ESF) #12, Energy.
- ...State Government: Locals need to collaborate with states which--along w/ large-scale utilities and regulatory bodies--are well on their way to assuring energy reliability
- ...Local Government: Locals have a mandate and mission to deliver *customer-driven public services* with *acceptable levels of performance*.

Project Goals...

1. Publish *Energy Assurance Guidelines for Local Governments...* companion to the NASEO Guidelines
2. Develop a local government energy assurance assessment tool (mobilize to address ESF #12 responsibilities)
3. Publish policy & technical papers (e.g., economics of energy assurance, renewable energy technology options)
4. Train & educate locals in support of the National Incident Management System (NIMS), National Response Framework (NRF) and Emergency Support Functions (ESF12)
5. Test market the assessment tool w/ select local governments prior to national distribution

Goal 1. Energy Assurance Guidelines...Providing information on how to...

- Build organizational relationships and ID experts
- Minimize impacts of short-term energy disruptions
- Increase awareness of energy security and assurance issues
- Assess back-up power strategies, technologies, and finance options
- Use sustainability to enhance energy assurance
...for example...decrease carbon footprint through renewables

Goal 2: Develop an energy assurance assessment tool to address...



- ESF #12
- Customer-driven public service expectations (fire, police, health services, communications)
- Acceptable performance (response time, quality of service, user-friendly, seamless, issue resolution)

The assessment tool uses hardness to assess vulnerability to an energy emergency...

Methods to harden facilities

- Deploy small-scale energy back-up systems at key facilities that can also serve as primary systems
- Employ conservation, efficiency & non-capital intensive alternatives to reduce demand

Benefits of hardening facilities

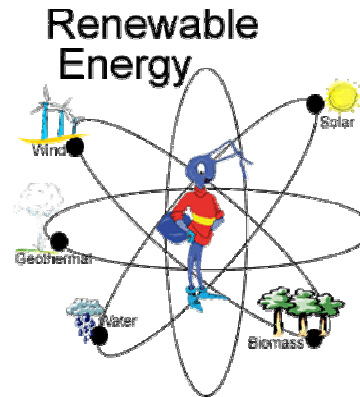
- Lower price volatility... with renewables
- Peak shaving... benefits both the utility & government if time-of-day rates are in effect
- Net metering... assuming a favorable regulatory environment
- Rapid dispatch... can be brought on-line very quickly
- No down-time... uninterruptible power supply, UPS

Energy hardness can be...

- expressed as a number (hardness factor)
- used to benchmark a facility, system or component and set hardening goals
- improved over time

What are the main components of the Energy Hardness Factor?...

- Fuel supply: diversified source of energy to maintain mission critical operations over an acceptable period of time... think hybrid & flex-fuel vehicles...



- Reliable equipment: back-up equipment capable of serving a primary role if necessary
- Trained personnel

Energy Hardness Factor: energy supply component

1. primary energy provider...municipal or investor-owned utility
2. secondary energy provider... local government
3. primary vender/supplier
4. standby vender/supplier
5. mutual aid agreement, memorandum of understanding (MOU), intergovernmental agreement (IGA)

Energy supply assurance checklist...

Task	Done?
Onsite generators are routinely exercised, fueled, and in stand-by mode	✓
Fuel storage capacity (diesel and gasoline) for multiple days for critical operations	
Numerous storage facilities located strategically around the city are regularly consumed and refreshed	
Capability to deliver fuel citywide via numerous tanker vehicles	
Refueling routes in place and current	✓
Identified personnel (primary and alternate) to operate the refueling equipment and trucks	
Inventory of roll-up generators with fuel are routinely exercised	
Fuel Reserve Sensors in place to automatically alert suppliers and city personnel of impending needs	
Facilities with mission critical operations have uninterruptable power supply (UPS)	✓
Critical operations fuel priority decisions are in place	
Diverse portfolio of back-up energy technology in place (renewables, etc.)	
Plans for facility consolidation are in place and staff is aware of these alternate work sites	
Communication plans for all energy emergency operations are in place	
Emergency purchase authorizations are in place for fuel acquisition	✓
Contracts with fuel suppliers address that the city gets top priority, tankers can be located onsite, and fuel for a minimum of 72 hours of operation is mandatory	

Deriving the Energy Hardness Factor

Steps 1-4 (20)

Step 1. Facility		Step 2.	Step 3. Impacts/Functions *				Step 4, Priority (1-5)
Step 1a	Step 1b		Step 3a	Step 3b	Step 3c	Step 3d	
Facility name & systems &/or components	Facility address	Responsible party or ownership	Communi-cations	Public Health & Safety: Life Saving	Public Health Safety: Life Sustaining	Systems Rehab to maintain orderly functioning	Critical Essential Import. Moderate Low
Fire Station		City		X	X	X	2
Primary Data Center		City	X				1
Health Medical Center		State/City		X	X		2

•Adapted from Critical Infrastructure Assurance Guidelines for Municipal Governments: Planning for Electric Power Disruptions, Chicago Metropolitan Area..., Argonne National Laboratory, 2/2001, pages 16, 17.

Step 4. Priorities (1-5) for critical facilities, systems and components...

- Critical: Failure may result in death, injury, severe financial loss or legal liability. Impossible or impractical to work around.
- Essential: Cannot fail for an extended period of time. Cumbersome or unlikely to work around.
- Important: Needed and will be evaluated and addressed depending on the event.
- Moderate: Can be postponed pending assessment.
- Low: Would result in an inconvenience.

Deriving the Energy Hardness Factor

Steps 5-13

Step 5	Step 6	Step 7	Step 8	Step 9	Step 10			Step 11	Step 12	Step 13	
Facility-specific energy demands	Operational uses of energy for this facility	Mission Critical operations in first 72 hours of emergency	Energy sources for mission critical ops.	Energy demand for the Step 8 ops.	(a) Backup systems in place; (b) energy type & source; (c) output rating in kw, therms, BTUs etc.			Low cost, no cost alternatives to reduce demand for these ops.	Estimate energy output for these alter.	Vulnerability Factor (VF) (a) Calculate demand shortfall in energy units: Step 9 - (10(c) + 12); (b) calculate VFL Step 13(a) / Step 9	
					10 (a) Back-up System	10 (b) Energy type & source	10 (c) Output rating			13(a) demand shortfall	13(b) VF

Step 7: List of mission critical operations during first 72 hours

Step 10: Data on current backup systems

Step 11: Low cost/no cost alternatives to reduce demand

Step 13: Vulnerability Factor

Energy Hardness Factor, Step 14

Step 14	
<u>Energy Hardness Factor:</u>	
0 <.....>	100
vulnerable	hard
100- Vulnerability factor	
	Energy Hardness Factor
	75 (3)

The hardness number is the percent of the demand that can be met by the current backup energy system. The parenthetical number following the hardness factor indicates the duration (in days) for which the fuel supply has been secured through inventory, contracts and the like—see checklist.

Next steps after determining a facility's energy hardness factor...

- Set goals for increasing energy hardness... ESF 12 and other drivers
- Identify options to accomplish these goals... Conservation (policies, procedures, rules, regulations, executive orders), renewables, traditional technology, efficiency and so on
- Estimate costs for each option
- Identify financing instruments to underwrite the costs (general fund, enterprise fund, performance contracting, revenue bond, general obligation bond, lease-purchase, etc)
- Develop strategic action plan
- Implement the plan

For more information...

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