EFFICIENCY AND RENEWABLE ELECTRICITY POTENTIAL STUDIES

APPROACHES, RESULTS, USES AND IMPLICATIONS

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Recent Optimal Energy Potential Studies

- VT Statewide Update – Achievable of Technical Potential (with VEIC)
- NW Vermont – Achievable of Technical (with VEIC)
- Michigan – Achievable of Economic (with VEIC)
- Maine – Achievable of Technical (with VEIC)
- New York State – Technical/Economic/Achievable/Program Funding Constrained (with VEIC/ACEEE)
- Long Island – Achievable (with VEIC)

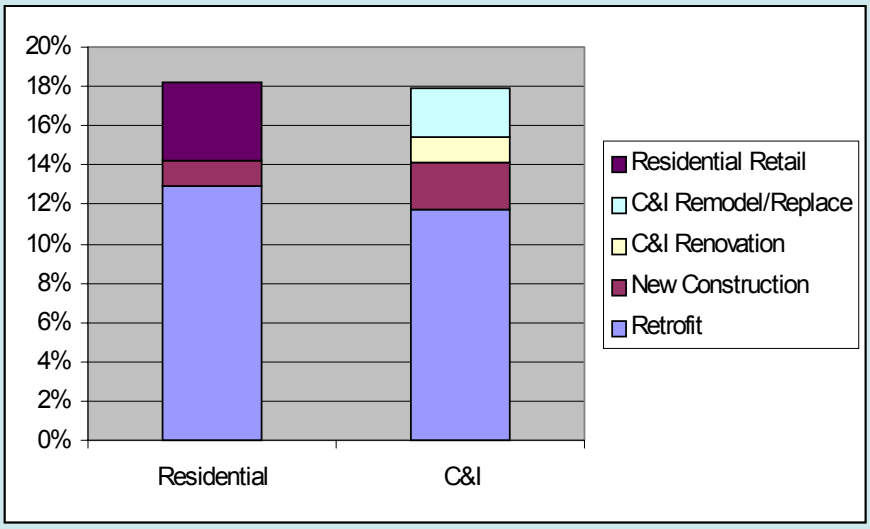
Uses for Efficiency and Renewables Potential Studies…

- Establishing levels of efficiency/renewable resource allocation (public goods charges)
- Supporting policy decisions (e.g., climate action targets)
- Least Cost Planning – traditional IRP
- Distributed Utility Planning – T&D LCP
- Renewable Portfolio Standards

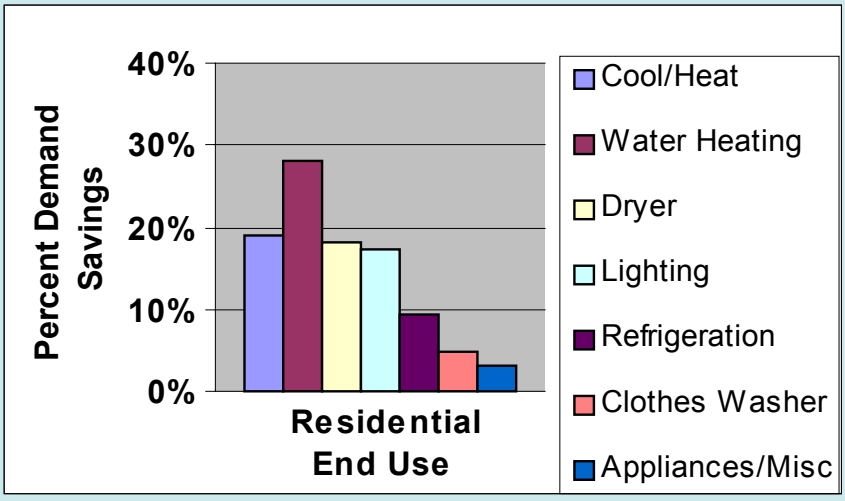
Velco Northwest Vermont Reliability Project Achievable Potential Study Scope

- Targeted Transmission area – 4 load zones
- Potential to defer ≈$100M investment in 345KV and 115KV lines
- Achievable potential from limited measures – excluded low peak coincidence measures, upstream regional strategy measures
- Conservative penetrations – increased confidence of success

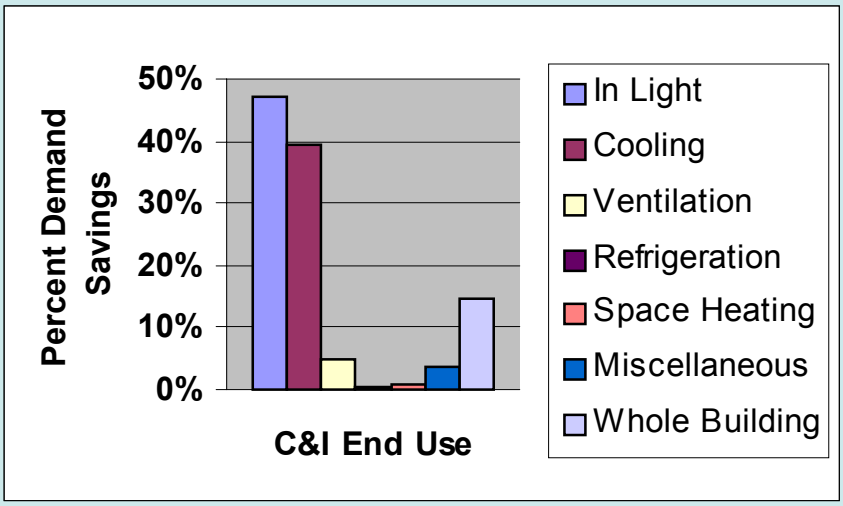
VELCO Achievable 2012 Potential as % of Forecast Sector MWh Sales



VELCO Achievable Potential Residential End-Use Summer Peak Demand Savings (kW) - 2012



VELCO Achievable Potential C&I End-Use Summer Peak Demand Savings (kW) - 2012



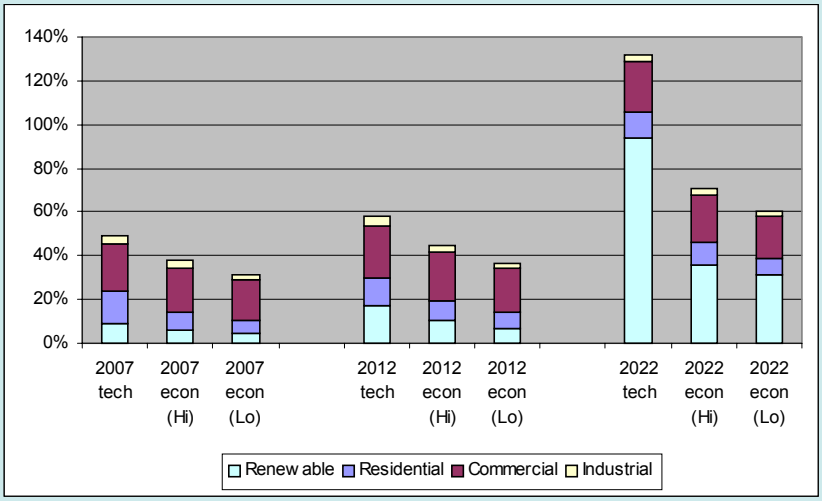
Velco Northwest Vermont Reliability Project Potential Study Uses

- Analysis of net transmission capacity cost of efficiency – "*the free lunch you're paid to eat*"
  - nets out benefits of: generation energy and capacity, distribution capacity, externalities, risk adjustment
  - ($250)/kW-yr net cost
- IRP – integration of transmission investment options, distributed generation, efficiency (5 scenarios analyzed)
- Max efficiency + CT is optimal (least cost) solution, but who pays?
- Section 248 hearings this summer

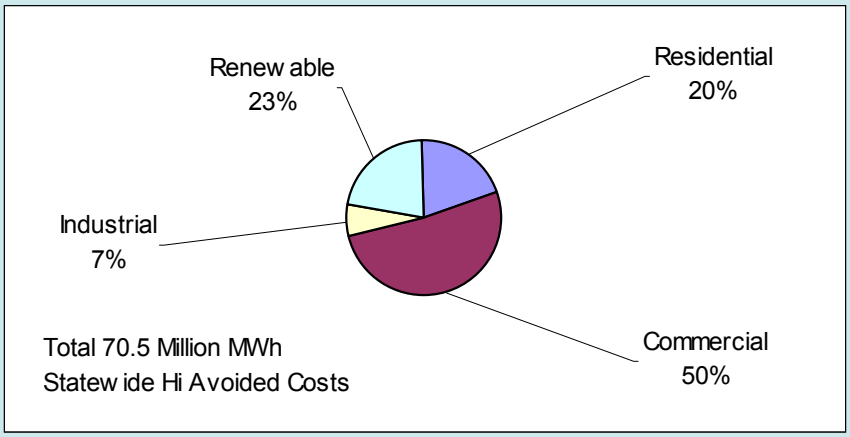
NYSERDA Potential Study Objectives

- Renewables & efficiency; tech, ec, greenhouse gas & currently planned initiatives potential
- 5, 10 and 20 year horizons (2007, 2012, 2022)
- Statewide and for 5 key load zones
  - Capital
  - Hudson Valley
  - Long Island
  - New York City
  - West

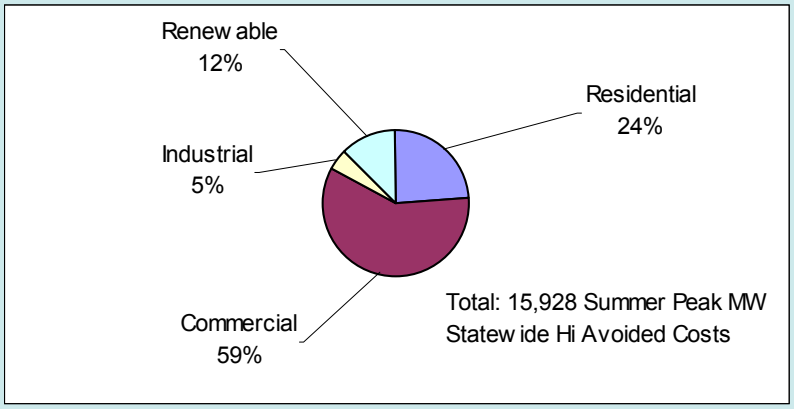
NYSERDA Technical & Economic Energy Savings Potential by Sector as % of Forecast MWh Sales



2012 Statewide Economic Energy Savings Potential (% Savings by Sector)



2012 Statewide Economic Capacity Savings Potential (% Savings by Sector)



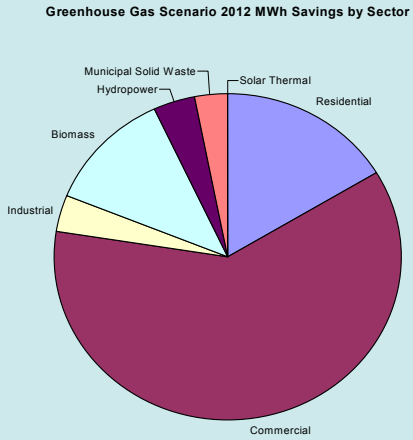
NYSERDA Greenhouse Gas Scenario

- For each efficiency and renewable technology, the study estimated
  - achievable electric energy contribution and
  - net costs of electric energy
- Net cost of electric energy =
  - Total resource cost, MINUS
  - Electric capacity value of kW saved or supplied

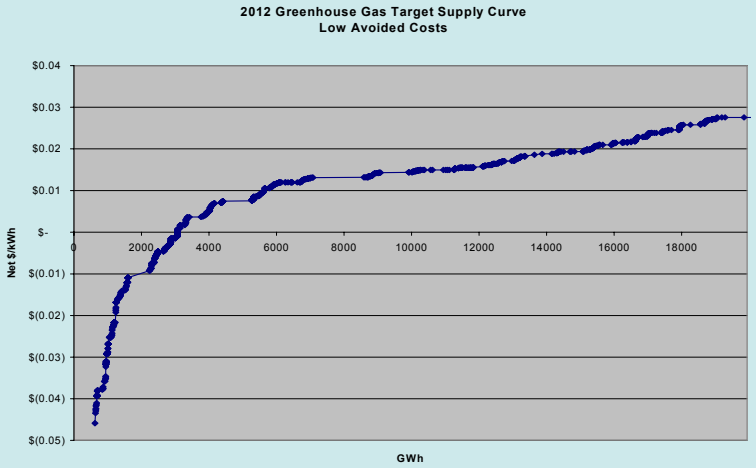
NYSERDA Greenhouse Gas Scenario

- The analysis "stacked" each technology's potential contribution in order of increasing cost (akin to power-plant dispatch order)
- Until the target for 2012 and for 2022 is met, or achievable resources exhausted, whichever came first

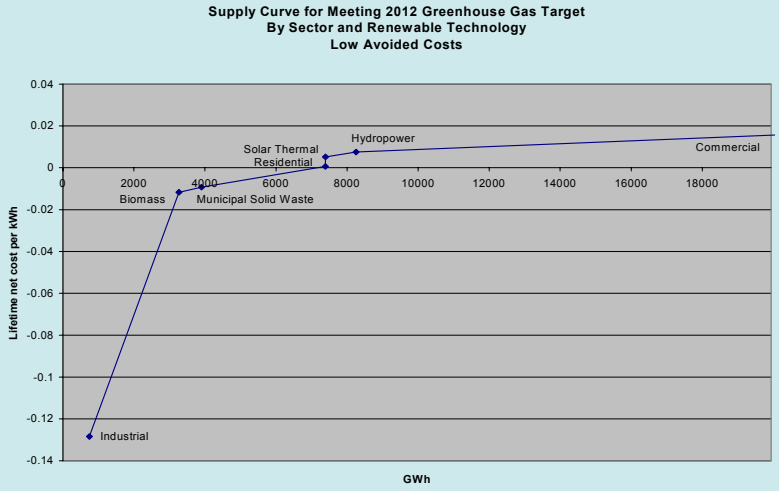
NYSERDA Greenhouse Gas Scenario Results



NYSERDA Greenhouse Gas Scenario Results (2)



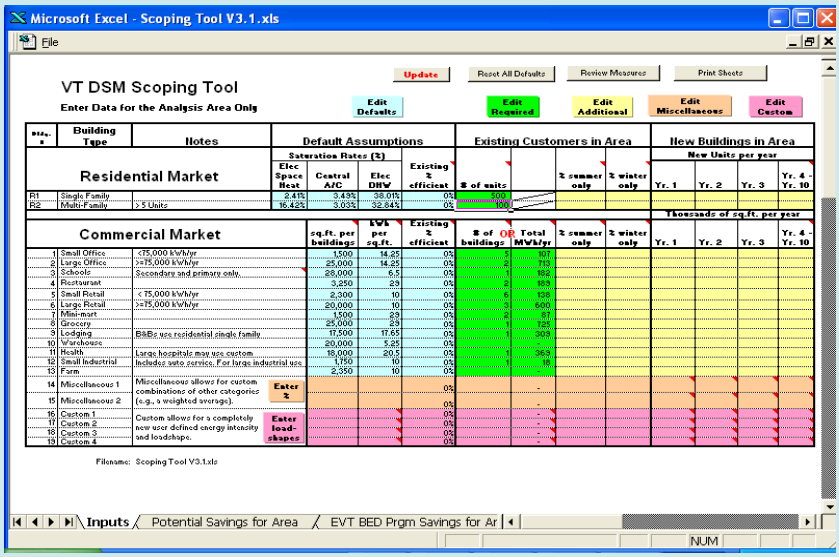
NYSERDA Greenhouse Gas Scenario Results (3)



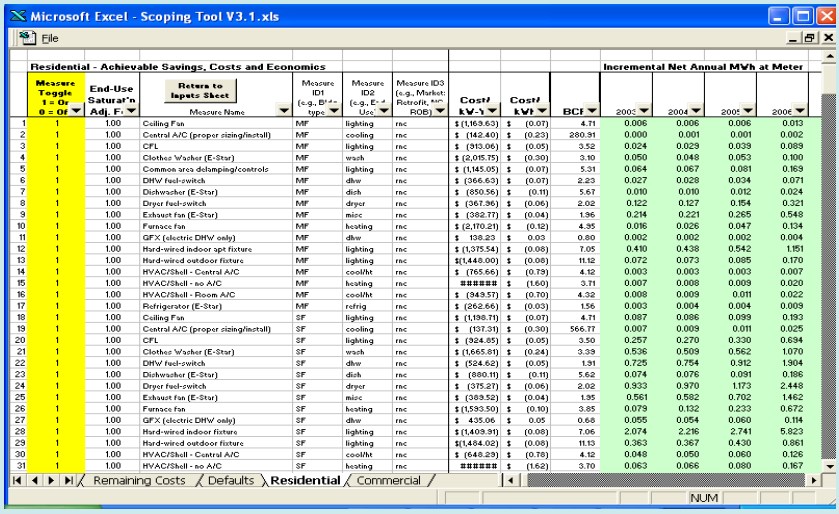
Distributed Utility Planning (DUP) Scoping Tool

- Problem: 22 DUs required to perform DUP, many with little or no expertise
- Solution: Scoping tool for quick and easy look at efficiency potential
- Quickly estimates whether energy efficiency potential is large enough to cost-effectively defer transmission and / or distribution upgrades
- Designed for any size DU or geographic area
  - Usable by utility staff untrained in DSM
- Currently used in VT area service collaboratives (ACSs)

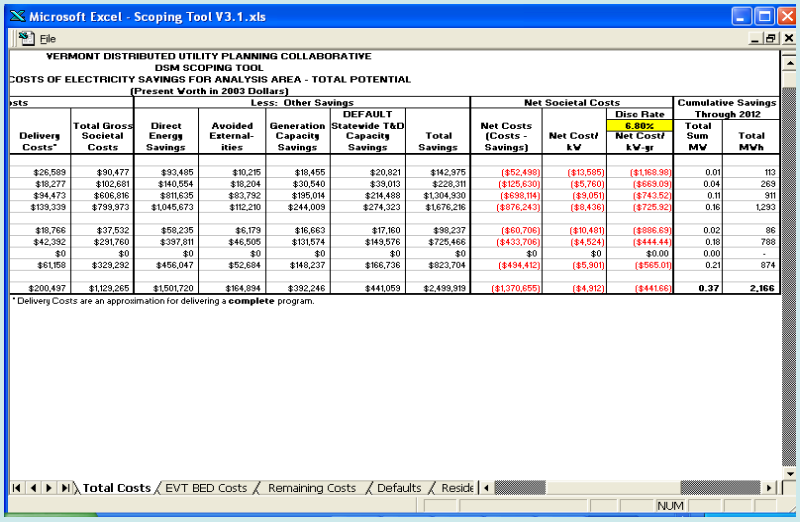
DUP Scoping Tool Input Sheet



DUP Scoping Tool Measure (≈3,000) Library



DUP Scoping Tool Sample Output



Microsoft Excel - Scoping Tool V3.1.xls

File

VERMONT DISTRIBUTED UTILITY PLANNING COLLABORATIVE
DSM SCOPING TOOL
COSTS OF ELECTRICITY SAVINGS FOR ANALYSIS AREA - TOTAL POTENTIAL
(Present Worth in 2003 Dollars)

sts		Less: Other Savings					Net Societal Costs			Cumulative Savings Through 2012	
					DEFAULT				Disc Rate		
Delivery Costs*	Total Gross Societal Costs	Direct Energy Savings	Avoided External-ities	Generation Capacity Savings	Statewide T&D Capacity Savings	Total Savings	Net Costs (Costs - Savings)	Net Cost/ kW	6.80% Net Cost/ kW-yr	Total Sum MW	Total MWh
$26,589	$90,477	$93,485	$10,215	$18,455	$20,821	$142,975	($52,498)	($13,585)	($1,168.98)	0.01	113
$18,277	$102,681	$140,554	$18,204	$30,540	$39,013	$228,311	($125,630)	($5,760)	($669.09)	0.04	269
$94,473	$606,816	$811,635	$83,792	$195,014	$214,488	$1,304,930	($698,114)	($9,051)	($743.52)	0.11	911
$139,339	$799,973	$1,045,673	$112,210	$244,009	$274,323	$1,676,216	($876,243)	($8,436)	($725.92)	0.16	1,293
$18,766	$37,532	$58,235	$6,179	$16,663	$17,160	$98,237	($60,706)	($10,481)	($886.69)	0.02	86
$42,392	$291,760	$397,811	$46,505	$131,574	$149,576	$725,466	($433,706)	($4,524)	($444.44)	0.18	788
$0	$0	$0	$0	$0	$0	$0	$0	$0	$0.00	0.00	-
$61,158	$329,292	$456,047	$52,684	$148,237	$166,736	$823,704	($494,412)	($5,901)	($565.01)	0.21	874
$200,497	$1,129,265	$1,501,720	$164,894	$392,246	$441,059	$2,499,919	($1,370,655)	($4,912)	($441.66)	**0.37**	**2,166**

* Delivery Costs are an approximation for delivering a **complete** program.

Total Costs | EVT BED Costs | Remaining Costs | Defaults | Reside

NUM

Summary and Conclusions

- Usefulness of more studies depends on goals and data
  - Focus should be on refining first cut information for targeted areas with more detailed, accurate and timely data
- Potential analysis has clear and important role in policy decisions and resource investment portfolios, *but*….don't put the cart before the horse — let the need drive the analysis.