



CalPlug Set-Top Box Workshop
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NATIONAL ENERGY MODELING Set-Top Boxes

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NATIONAL ENERGY MODELING - Set-Top Boxes

Base Assumptions:

- **Align with Energy Advocates National Energy View**
 - June 2011 NRDC “Energy Facts...”
 - August 2012 ECOVA “PCC Presentation”
- **Industry Trends/Assumptions/Facts (affecting energy use)**
 - **Subscriber growth: Flat**
 - **TVs*: 70% have HDTV – 48% of those have two!**
 - **STBs: HD, AVP standard**
 - **DVRs**: 43% have DVR - 23% of those have two!**
- **Industry average STB lifetime – 6 to 7 years**
 - **Very high percentage of installed base is replaced by 2020**
- **Current STB features through 2020**
 - **New features not a significant national energy user**

*Leichtman Research Group, Inc. – 2011 see http://www.lightreading.com/document.asp?doc_id=216031&site=lr_cable

** Nielsen – 2012- see http://www.thecab.tv/main/bm~doc/time-shifting-2012_public.pdf

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Today - Estimated National Energy Consumption - ECOVA

		On			Sleep			UEC	Units	TEC	Power Plants
		Watts	Hours	kWh/yr	Watts	Hours	kWh/yr	kWh/yr	Millions	TWh/yr	Rosenfelds
Cable	DVRs	33	11.5	139	31	12.5	142	280	27	7.6	2.5
	Receivers	16	11.5	68	15	12.5	70	138	57	7.9	2.6
	Clients	11	11.5	47	9	12.5	42	88	2	0.1	0.0
	DTAs	5	11.5	19	4	12.5	20	39	33	1.3	0.4
Satellite	DVRs	33	11.5	139	31	12.5	142	281	21	5.9	2.0
	Receivers	13	11.5	55	12	12.5	55	109	58	6.3	2.1
Telco	DVRs	17	11.5	71	15	12.5	68	138	6	0.8	0.3
	Receivers	11	11.5	45	10	12.5	44	89	21	1.9	0.6
U.S. Total				582			582		225	32	10.6

Sources: SNL Kagan (2012), NRDC (2011), Porter, Moorefield, & May-Ostendorp (2006), Urban, Tiefenbeck, & Roth (2011)



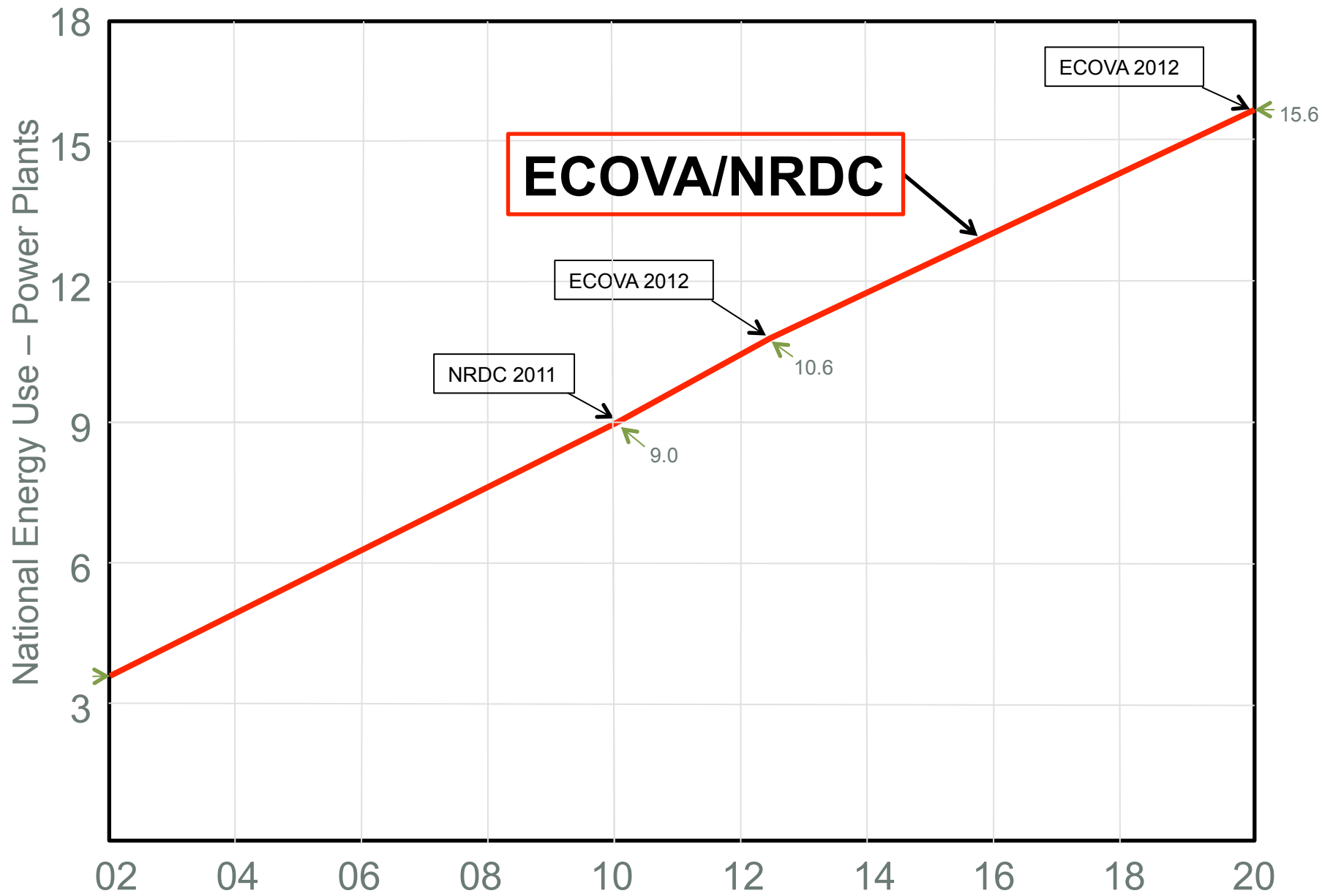
GL/GH agreed adjustment

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Tomorrow - Trend toward multiple DVRs per home - ECOVA

		On			Sleep			UEC	Units	TEC	Power Plants
		Watts	Hours	kWh/yr	Watts	Hours	kWh/yr	kWh/yr	Millions	TWh/yr	Rosenfelds
Cable	DVRs	33	11.5	139	31	12.5	142	280	57	16.0	5.3
	Receivers	16	11.5	68	15	12.5	70	138	27	3.7	1.2
	Clients	11	11.5	47	9	12.5	42	88	2	0.1	0.0
	DTAs	5	11.5	19	4	12.5	20	39	33	1.3	0.4
Satellite	DVRs	33	11.5	139	31	12.5	142	281	71	19.9	6.6
	Receivers	13	11.5	55	12	12.5	55	109	21	2.3	0.8
Telco	DVRs	17	11.5	71	15	12.5	68	138	21	2.9	1.0
	Receivers	11	11.5	45	10	12.5	44	89	6	0.5	0.2
U.S. Total				582			582		238	47	15.6

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WHAT IF:

Satellite STBs  **ENERGY STAR V3 and Whole-Home DVRs**

Cable STBs  **ENERGY STAR V3 and DVRs “Light” SLEEP**

Telco STBs  **ENERGY STAR V3 and Whole-Home DVRs**

Disclaimer:

The views and opinions expressed here are my own only and in no way represent the views, positions or opinions - expressed or implied - of my employer or anyone else!

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Today - Estimated National Energy Consumption - ECOVA

		On			Sleep			UEC	Units	TEC	Power Plants
		Watts	Hours	kWh/yr	Watts	Hours	kWh/yr	kWh/yr	Millions	TWh/yr	Rosenfelds
Cable	DVRs	33	11.5	139	31	12.5	142	280	27	7.6	2.5
	Receivers	16	11.5	68	15	12.5	70	138	57	7.9	2.6
	Clients	11	11.5	47	9	12.5	42	88	2	0.1	0.0
	DTAs	5	11.5	19	4	12.5	20	39	33	1.3	0.4
Satellite	DVRs	33	11.5	139	31	12.5	142	281	21	5.9	2.0
	Receivers	13	11.5	55	12	12.5	55	109	58	6.3	2.1
Telco	DVRs	17	11.5	71	15	12.5	68	138	6	0.8	0.3
	Receivers	11	11.5	45	10	12.5	44	89	21	1.9	0.6
U.S. Total				582			582		225	32	10.6

Today - Cable "Light" Sleep (APD) for 10M DVR STBs

		On			Sleep			UEC	Units	TEC	Power Plants
		Watts	Hours	kWh/yr	Watts	Hours	kWh/yr	kWh/yr	Millions	TWh/yr	Rosenfelds
Cable	DVRs	33	11.5	139	31	12.5	142	280	17	4.8	1.6
	APD DVRs	33	11.5	139	24	12.5	107	246	10	2.5	0.8
	Receivers	16	11.5	68	15	12.5	70	138	57	7.9	2.6
	Clients	11	11.5	47	9	12.5	42	88	2	0.1	0.0
	DTAs	5	11.5	19	4	12.5	20	39	33	1.3	0.4
Satellite	DVRs	33	11.5	139	31	12.5	142	281	21	5.9	2.0
	Receivers	13	11.5	55	12	12.5	55	109	58	6.3	2.1
Telco	DVRs	17	11.5	71	15	12.5	68	138	6	0.8	0.3
	Receivers	11	11.5	45	10	12.5	44	89	21	1.9	0.6
U.S. Total				720			689		225	31	10.5

Saves:
350M kWh
0.12 Rs

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ENERGY STAR V3

QPL TEC Avg. (8/1/12)

HD DVR (DVR,MS,AVP,HD):

- Cable (DOCSIS, CableCard) 160 (4 units)
- Satellite 122 (1 unit)
- IP 137 (5 units)

HD non-DVR (AVP,HD):

- Cable (DOCSIS, CableCard) 121 (11 units)
- Satellite 93 (6 units)
- IP (MS) 92 (10 units)

HD DVR Multi-Room (DVR,MS,AVP,HD,MR)

- Cable (DOCSIS, CableCard) 207 (5 units)
- Satellite 199 (4 units)
- IP 135 (4 units)

Clients (AVP,HD,HNI):

66 (2 units)

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Tomorrow - Trend towards multiple DVRs per home - ECOVA

		On			Sleep			UEC	Units	TEC	Power Plants
		Watts	Hours	kWh/yr	Watts	Hours	kWh/yr				
Cable	DVRs	33	11.5	139	31	12.5	142	280	57	16.0	5.3
	Receivers	16	11.5	68	15	12.5	70	138	27	3.7	1.2
	Clients	11	11.5	47	9	12.5	42	88	2	0.1	0.0
	DTAs	5	11.5	19	4	12.5	20	39	33	1.3	0.4
Satellite	DVRs	33	11.5	139	31	12.5	142	281	71	19.9	6.6
	Receivers	13	11.5	55	12	12.5	55	109	21	2.3	0.8
Telco	DVRs	17	11.5	71	15	12.5	68	138	21	2.9	1.0
	Receivers	11	11.5	45	10	12.5	44	89	6	0.5	0.2
U.S. Total				582			582		238	47	15.6

Tomorrow - ECOVA - ENERGY STAR V3

		On			Sleep			UEC	Units	TEC	Power Plants
		Watts	Hours	kWh/yr	Watts	Hours	kWh/yr				
Cable	DVRs							160	57	9.1	3.0
	Receivers							121	27	3.3	1.1
	Clients							66	2	0.1	0.0
	DTAs	5	11.5	19	4	12.5	20	39	33	1.3	0.4
Satellite	DVRs							199	71	14.1	4.7
	Receivers							93	21	2.0	0.7
Telco	DVRs							137	21	2.9	1.0
	Receivers							92	6	0.6	0.2
U.S. Total				19			20		238	33	11.1

**Saves:
14 TWh
4.5 Rs
\$1.7B**

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Tomorrow - Trend towards multiple DVRs per home - ECOVA

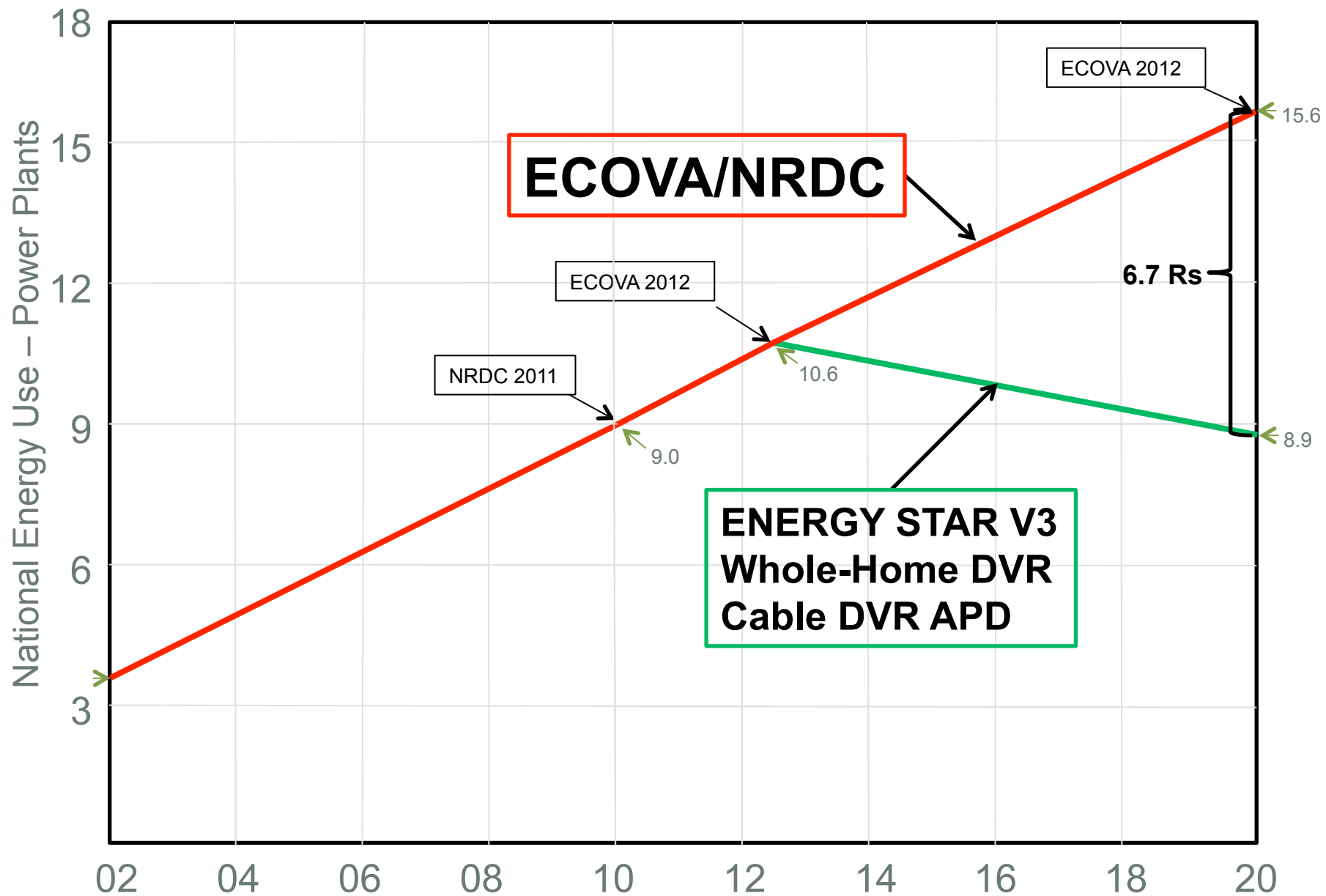
		On			Sleep			UEC	Units	TEC	Power Plants
		Watts	Hours	kWh/yr	Watts	Hours	kWh/yr	kWh/yr	Millions	TWh/yr	Rosenfelds
Cable	DVRs	33	11.5	139	31	12.5	142	280	57	16.0	5.3
	Receivers	16	11.5	68	15	12.5	70	138	27	3.7	1.2
	Clients	11	11.5	47	9	12.5	42	88	2	0.1	0.0
	DTAs	5	11.5	19	4	12.5	20	39	33	1.3	0.4
Satellite	DVRs	33	11.5	139	31	12.5	142	281	71	19.9	6.6
	Receivers	13	11.5	55	12	12.5	55	109	21	2.3	0.8
Telco	DVRs	17	11.5	71	15	12.5	68	138	21	2.9	1.0
	Receivers	11	11.5	45	10	12.5	44	89	6	0.5	0.2
	U.S. Total			582			582		238	47	15.6

Tomorrow - ECOVA - ENERGY STAR V3, Satellite and Telco Whole-Home DVR

		On			Sleep			UEC	Units	TEC	Power Plants
		Watts	Hours	kWh/yr	Watts	Hours	kWh/yr	kWh/yr	Millions	TWh/yr	Rosenfelds
Cable	DVRs							160	57	9.1	3.0
	Receivers							121	27	3.3	1.1
	Clients							66	2	0.1	0.0
	DTAs	5	11.5	19	4	12.5	20	39	33	1.3	0.4
Satellite	WH DVRs							208	24	5.0	1.7
	Clients							66	47	3.1	1.0
	Receivers							93	21	2.0	0.7
Telco	WH DVRs							137	6	0.8	0.3
	Receivers							92	21	1.9	0.6
	U.S. Total			19			20		238	27	8.9

**Saves:
20 TWh
6.7 Rs
\$2.4B**

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Implementing these actions will...

- Cap household consumption to today's levels
- Decrease household consumption to 2010 levels by 2020
- Provide a Clear and Measureable Goal
 - To Providers, Manufacturers, Advocates, Regulators
 - ESv3 is well understood
 - ESv3 products available in most product classes

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Challenges...

- “Information Services” add “appliance level consumption”
 - Consumer Information Services – Internet, Video, Voice, ...
 - Video Service Only: today - 320 kWh/y per HH
 - Consumer Video Subscription - \$600 to \$1500 per year
- “Information Services” requires energy use flexibility
 - Increasing consumption of a single device may lower HH usage
 - Combining functions lowers HH usage but runs against usage limits

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Thank You