

Energy Efficiency & Behind-the-Meter Impacts: Gold Book 2017

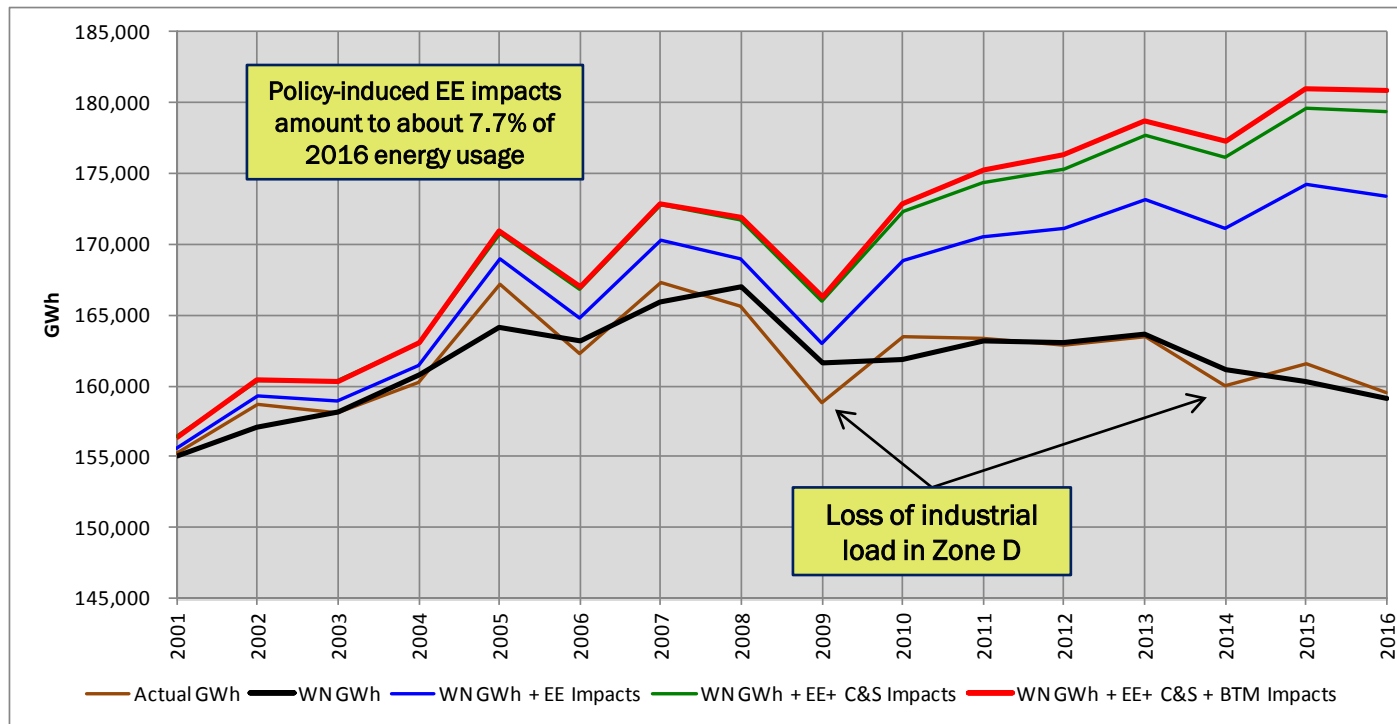
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Electric System Planning Working Group Meeting

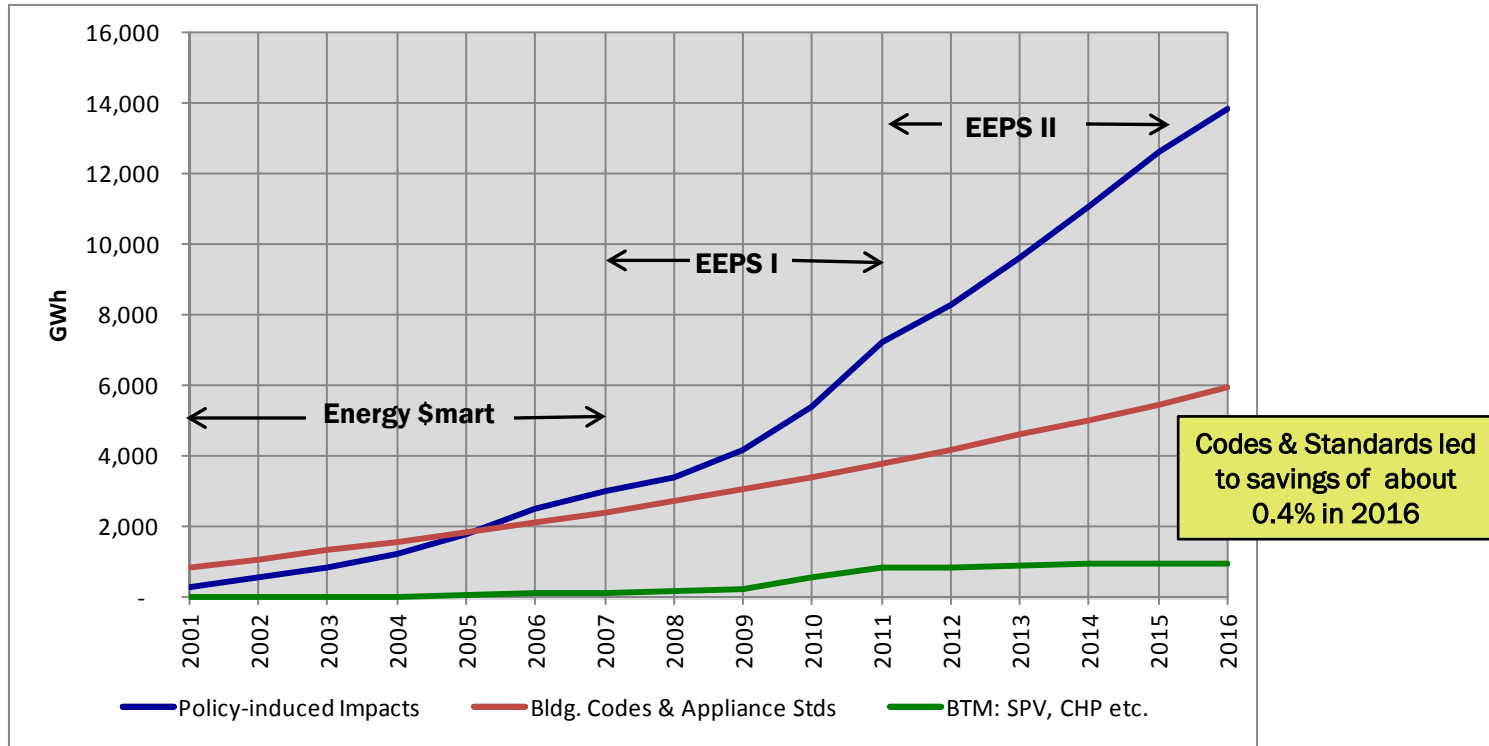
April 19, 2017, Rensselaer, NY

NYCA Energy Usage and Savings: 2001-16



EE Impacts include NY Energy \$mart, EEPS, NYPA, and LIPA/PSEG programs; Codes & Standards impacts imputed based on analysis of sectoral analysis; BTM includes Solar PV, CHP, ADG, etc.

History of Energy Savings Impacts



EE Impacts include NY Energy \$mart, EEPS, NYPA, and LIPA/PSEG programs; Codes & Standards impacts imputed based on analysis of multiple studies; BTM includes Solar PV, CHP, ADG, etc.



Proposed Energy Saving Programs: 2017-2026

- **Energy Efficiency related programs**
 - Utility Energy Efficiency Transition Implementation Plans (ETIPs)
 - NYSERDA’s 2017-18 Clean Energy Fund Transition Plan including Resource Acquisition and Market Development initiatives
 - Clean Energy Fund’s 10-year Market Transformation and Innovation Portfolio (2016-2025)
 - NY Green Bank’s investments targeted at EE
- **NY-Sun and other Behind-the-Meter Generation**
 - 2023 target of around 3,200 MW DC of BTM SPV
 - CEF’s Onsite Generation projects (CHP, ADG, etc.)

NY-Sun Goals

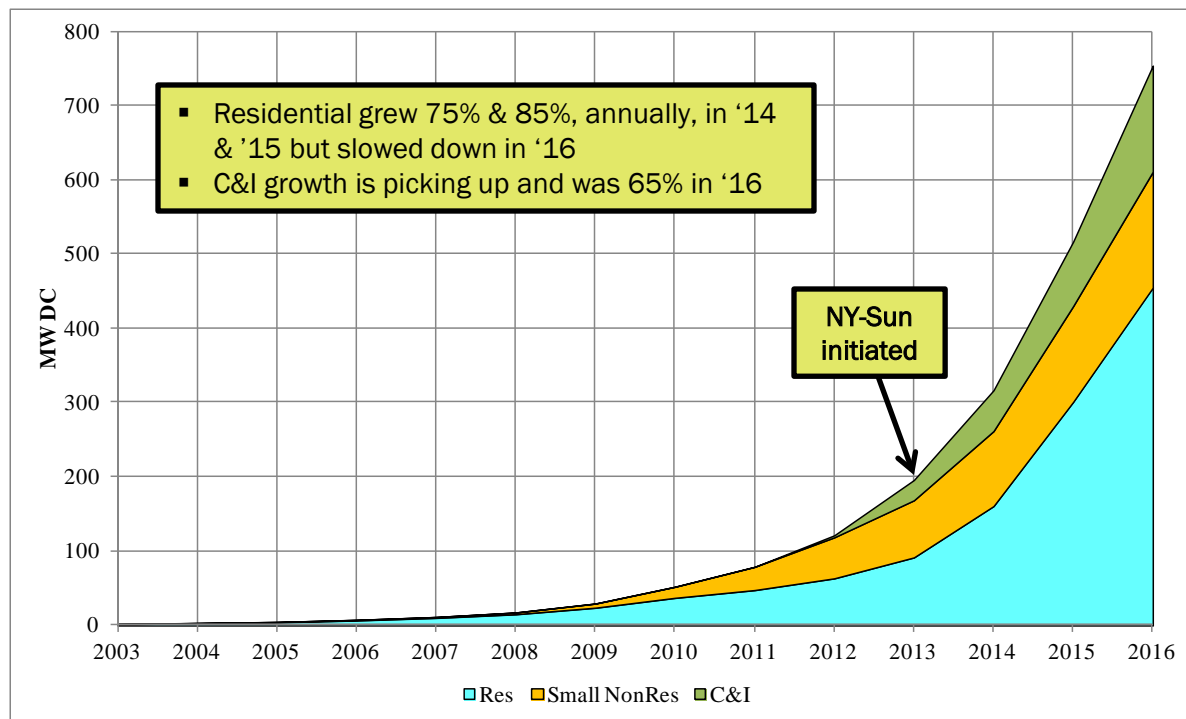
(All figures in MW DC)

	Sub-200 kW Systems		200 kW+ Systems	Total
	Residential	Small Commercial	C & I*	
Long Island	149	58	0	207
Con Ed Territory	304	305	340	949
Rest of State	448	451	1272	2171
Total	901	814	1612	3327

* These figures reflect an allowance of 20% of attrition on expected applications.

- The statewide ‘Inventory’ of proposed projects is over 3,500 MW AC (about 4,200 MW DC).
- Long Island ‘exhausted’ its Residential allocation in April 2016.
- As of 3/15/17, 625 MW of the capacity is *signed-up* or in the pipeline in the Sub-200kW program and around 1,100 MW is in the C&I program pipeline.

History of Solar PV in New York



- Recently initiated, the Community Distributed Generation (CDG) program has just a few installations but constitutes about 40% of the 'pipeline'.
- As reported by NY-Sun, of the 933 MW in the pipeline as of 1/31/17, 367 MW are CDG and 424 MW is C&I.

Future Energy Efficiency Program Plans

	Period	GWh Goal
ETIP	2016-18	1,414
Transition Plan	2016-18	865
CEF Market Transformation Portfolio	2019-25	7,792
Total	2016-25	10,071

- Beyond the Transition Plan (2019 onwards) CEF program impacts are not driven by incentive payments and are projected to result in changed energy-usage behavior on the part of residential, commercial, and industrial customers.
- Projected impacts are assumed to have a geographical distribution similar to the historic patterns revealed in previous policy-based EE programs.
- NY Green Bank initiatives do not follow prescribed targets; involve supplemental funds from private sources; repaid loans are recycled for future projects.

Gold Book 2017 Forecasts

All forecasts presented here are preliminary and subject to revisions based on ongoing discussions and review of submissions by Transmission Owners.

Gold Book 2017 SPV Impacts (Energy GWh)

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2017	116	68	165	10	109	350	324	35	46	170	452	1,845
2018	161	114	235	13	135	464	432	48	63	231	696	2,592
2019	195	142	280	22	166	547	516	62	82	299	827	3,138
2020	226	165	318	32	194	621	591	79	105	380	912	3,623
2021	247	178	341	40	213	670	644	99	131	473	973	4,009
2022	265	190	361	48	231	710	690	117	155	558	1,009	4,334
2023	281	200	376	56	247	743	727	133	175	631	1,032	4,601
2024	294	208	389	63	260	768	757	146	193	694	1,056	4,828
2025	304	215	398	70	272	787	780	158	208	749	1,080	5,021
2026	313	220	405	77	282	802	799	168	221	796	1,103	5,186
2027	320	224	410	82	290	812	813	177	232	837	1,127	5,324

System-wide impacts are greater than those in the 2016 Gold Book primarily due to the advent of CDG and higher projected Downstate penetration

Gold Book 2017 SPV Impacts (Summer MW)

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2017	22	14	31	2	19	68	67	8	11	38	170	450
2018	28	20	41	3	23	83	82	11	15	52	272	630
2019	32	24	47	4	27	95	94	14	19	68	314	738
2020	36	27	52	6	31	105	105	18	24	87	347	838
2021	39	28	55	7	33	111	112	22	30	109	371	917
2022	41	30	57	8	35	117	118	26	35	129	385	981
2023	43	31	59	9	37	121	123	29	40	146	394	1,032
2024	45	32	61	10	39	124	127	32	44	160	403	1,077
2025	46	33	62	11	41	126	129	35	47	172	412	1,114
2026	47	33	62	12	42	128	132	37	50	183	421	1,147
2027	48	34	63	13	43	129	133	39	52	192	430	1,176

System-wide impacts are greater than those in the 2016 Gold Book primarily due to the advent of CDG and higher projected Downstate penetration

Gold Book 2017 EE & C&S Impacts (GWh)

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2017	143	81	133	12	71	122	91	21	48	429	179	1,330
2018	324	190	302	27	162	278	207	39	73	650	425	2,677
2019	522	324	482	43	261	452	318	56	91	804	644	3,997
2020	685	431	635	57	344	596	413	72	113	1,002	854	5,202
2021	833	538	784	71	420	721	513	90	136	1,204	1,059	6,369
2022	988	651	940	86	501	853	619	109	159	1,406	1,253	7,565
2023	1,142	762	1,095	101	580	982	725	128	181	1,608	1,436	8,740
2024	1,290	870	1,245	115	657	1,107	828	146	203	1,801	1,612	9,874
2025	1,437	976	1,394	129	733	1,231	930	163	223	1,976	1,791	10,983
2026	1,534	1,044	1,494	138	784	1,313	996	175	240	2,130	1,955	11,803
2027	1,624	1,108	1,587	147	831	1,389	1,056	186	255	2,261	2,089	12,533

*Overall, the levels are comparable to the 2016 Gold Book.
Relatively lower near-term impacts reflect slower-than-expected progress in
some utility ETIP programs*

Gold Book 2017 Distributed Generation (GWh)

Year	A	B	C	D	E	F	G	H	I	J	K	NYCA
2017	115	22	285	3	87	147	6	20	80	802	17	1,584
2018	121	22	290	3	88	149	6	22	86	857	17	1,661
2019	124	22	295	3	90	169	19	24	95	953	17	1,811
2020	124	22	295	3	133	286	19	24	101	1,013	17	2,037
2021	124	22	295	3	133	286	19	27	104	1,040	17	2,070
2022	124	23	304	3	147	307	25	27	109	1,085	17	2,171
2023	128	23	321	5	147	306	25	27	111	1,112	17	2,222
2024	128	23	328	5	154	331	25	29	117	1,166	17	2,323
2025	131	23	328	5	154	331	27	29	119	1,190	17	2,354
2026	132	23	332	5	158	339	27	31	124	1,242	17	2,430
2027	132	24	334	5	160	338	27	31	127	1,268	17	2,463

System-wide, the impact levels are higher than the 2016 Gold Book figures – largely due to more optimistic forecast of CHP growth Downstate

The Mission of the New York Independent System Operator, in collaboration with its stakeholders, is to serve the public interest and provide benefits to consumers by:

- Maintaining and enhancing regional reliability
- Operating open, fair and competitive wholesale electricity markets
- Planning the power system for the future
- Providing factual information to policy makers, stakeholders and investors in the power system



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