ADVANCED CODES AND STANDARDS

Final Initiative Level Logic Model Report

Prepared for

The New York State
Energy Research and Development Authority

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Energy Research and Development Authority

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(July 10, 2013)

The New York Public Service Commission's (PSC) decision to establish a System Benefits Charge (SBC) program over a decade ago has led to one of the nation's most vibrant energy efficiency and renewable energy markets in the country. The PSC issued the Order Continuing Systems Benefit Charge and Approving the Operating Plan for A Technology and Market Development (T&MD) Portfolio of System Benefits Charge Funded Programs (The Order) on October 24, 2011. The Order approved the T&MD portfolio proposed by the New York State Energy Research and Development Authority (NYSERDA) for the five-year period of January 1, 2012 through December 31, 2016, and allocated a total budget in excess of $16M to the Advanced Codes and Standards Initiative for that period.

The purpose of this document is to present the overarching logic model for the elements comprising the Advanced Codes and Standards Initiative.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

INITIATIVE DESIGN TEMPLATE

The purpose of this document is to present the overarching logic model for the Advanced Codes and Standards Program. This document's organization discusses each of the Logic Model components described below:

1. **Initiative Context, Stakeholders, Intent and Design** - Describes the problem(s) the initiative is attempting to solve, or issues it will address, and the regulatory and stakeholder environments (context) within which the initiative is working.

2. **Initiative Objectives** - Describes, at a high level, the initiative's ultimate purpose and targets.

3. **Initiative Resources** - Identifies the funding, workforce, partnership, and other resources the initiative is providing.

4. **Initiative Activities** - Describes the initiative's various researches, product development, demonstration and commercialization progress, and support activities.

5. **Initiative Outputs** - Describes the anticipated immediate results associated with initiative activities.

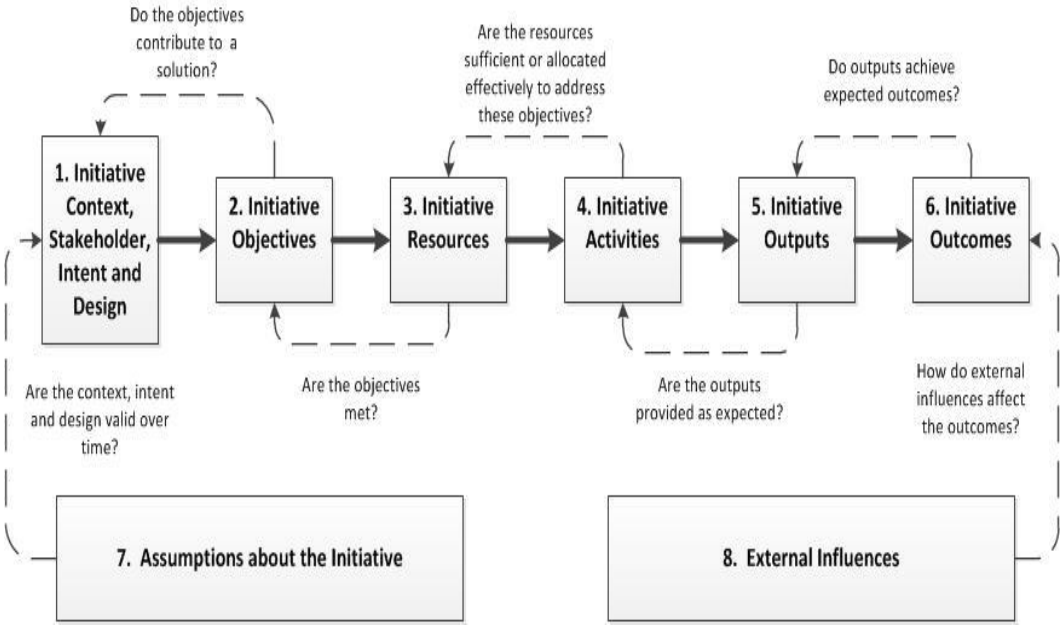
6. **Initiative Outcomes** - Describes expected achievements in the near, intermediate, and longer term.

7. **Assumptions about The Initiative** - Describes assumptions about how initiative activities and outputs will lead to the desired near, intermediate, and longer-term outcomes.

8. **External Influences** - Describes factors outside the initiative that may drive or constrain the achievement of outcomes.

Figure T-1 provides a graphic representation of the relationship between these eight items described above.

Figure T-1: Initiative Design Template



Section 1:

INITIATIVE CONTEXT, STAKEHOLDERS, INTENT, AND DESIGN

The Advanced Codes and Standards Initiative consists of two components: a set of code activities targeted at the commercial and residential building sectors in New York State and a set of standards activities directed towards state and national appliance and equipment standards and specification setting processes for various equipment types. Table 1-2 (Codes) and Table 1-3 (Standards) detail the barriers addressed, and stakeholders impacted, by the initiative.

The Advanced Codes and Standards Initiative, funded in part by the American Recovery and Reinvestment Act of 2009 (ARRA), State Energy Program (SEP), and the Energy Efficiency and Conservation Block Grant (EECBG), provides technical assistance to the building community including local code enforcement officials in order to achieve the highest practical level of compliance with the statewide energy code. In implementing this initiative, NYSERDA works in close coordination with the New York Department of State (DOS), the agency charged with promulgation of New York's energy code, as well as related energy code training.

As a condition of receipt of ARRA funds and the primary goal of the code activities, New York State must achieve a 90% compliance rate with the state energy code - adopted on December 28, 2010 (Energy Conservation Construction Code of New York State) - by 2017. In New York State, the International Energy Conservation Code (IECC) serves as the basis for the residential and commercial energy code, although an alternate code path for commercial structures exists within the standards produced by the American Society of Heating, Air-Conditioning and Refrigeration Engineers (ASHRAE). Table 1-1 details the historical and forecasted energy code adoption in New York State as originally anticipated and with acceleration due to ARRA and other directives.

Table 1-1: Effective Dates of New York Energy Code Adoption with and without Acceleration

Effective Date	Expected Without Acceleration - Residential	Expected Without Acceleration – Commercial	With Acceleration - Residential	With Acceleration - Commercial
Prior to April 2010	2004 IECC	ASHRAE 04	2004 IECC	ASHRAE 04
April 2010	**2006 IECC**	ASHRAE 04	2004 IECC	ASHRAE 04
December 2010	2006 IECC	ASHRAE 04	**2009 IECC***	**ASHRAE 07***
April 2012	**2009 IECC**	**ASHRAE 07**	2009 IECC	ASHRAE 07
November 2013 (estimate)	2009 IECC	ASHRAE 07	2009 IECC	**ASHRAE 10**
May 2014 (estimate)	2009 IECC	ASHRAE 07	**2012 IECC**	
April 2015 (estimate)	**2012 IECC**	**ASHRAE 10**		

Note: Cells with bold text indicate when a code change would occur under each scenario.

* The December 2010 Energy Code acceleration was due to ARRA requirements.

There is a substantial energy savings gap between the ideal rate of code compliance (i.e., 100% of project design and construction meet code requirements) and the actual rate of code compliance. Best estimates for

statewide compliance, based on a study completed in 2012,[1] are 61% for residential construction and 36% for commercial relative to buildings that pass or fail the UA test under REScheck or COMcheck; following the BECP protocol, compliance was determined to be 73% and 85%, respectively. Acceptance of ARRA funds requires New York State to implement a plan to target and achieve 90% compliance with the State's energy code - adopted in December 2010 - by 2017. Aggressive increases of required building performance through advancing energy code adoption may exacerbate the gap between targeted and actual energy savings. The breadth of the initiative's efforts focused on the entire design and construction community to reduce this gap, in particular by using the results of the annual compliance studies to inform efforts undertaken in later years of the System Benefits Charge-IV (SBC-IV) period. No other funding source is focused on helping New York meet the required compliance level.

For appliance and equipment standards, activities include advocacy and providing technical expertise to state and national standards setting processes. New York's involvement in standards development has been essential to progress made to date. For select products, SEP funding has permitted NYSERDA's participation through public comments in federal standards development and adoption of state standards. For other product areas, NYSERDA has relied on cooperative work with other regional and national organizations.

Table 1-2 and Table 1-3 summarize the primary code- and standards-related problem areas to be addressed by the initiative, as well as the affected stakeholders.

Table 1-2: Code-Related Problems to be addressed by the Initiative

Problem Area and Barrier Details	**Stakeholders Impacted and/or Involved**
1. Technical Barriers: The following barriers can impact builders/contractors/building trades, designers, code enforcement offices, building owners/operators, residential homeowners.	
a. Wide variation in level of knowledge among code officials for code enforcement (e.g., review of plans and specifications; inspections) b. Wide variation in level of knowledge of code requirements among architects and the building trades c. Building science regarding the effects of code compliance is unclear d. Difficulty in proper design, installation and maintenance of equipment and automated systems designed to improve building energy efficiency	Builders/contractors/building trades, designers, code enforcement offices, building owners/operators, residential home owners
Problem Area and Barrier Details	**Stakeholders Impacted and/or Involved**
2. Economic Barriers: The following barriers can impact builders/contractors/building trades, building owners/operators, code enforcement offices.	
a. Increased code stringency is seen as a significant (and unbearable) cost by builders and consumers b. Increased code enforcement responsibilities for municipalities undergoing funding reductions c. Cost of third-party testing of ducts and installations d. Decreased funding for code administration and training	Builders/contractors/building trades, building owners/operators, code enforcement offices

[1] *New York Energy Code Compliance Study*. Vermont Energy Investment Corporation, June 6, 2012.

Problem Area and Barrier Details	Stakeholders Impacted and/or Involved
3. Informational Barriers: The following barriers can impact code enforcement offices, designers, builders/contractors/building trades, state agencies, energy efficiency initiative administrators (NYSERDA and utilities), and DPS staff.	
a. Energy codes are changing rapidly leading to an inconsistent understanding of design, construction, and enforcement requirements b. Statewide approach to code enforcement varies from jurisdiction to jurisdiction c. Code officials and design and construction communities lack an understanding of increasingly stringent code requirements d. Centralized source of statewide building data is absent e. Compliance Assessment protocols vary in approach, expense, and usefulness to program staff	Code enforcement offices, designers, builders/contractors/building trades, and state agencies Energy efficiency initiative administrators (NYSERDA and utilities), Department of Public Service (DPS) staff
Problem Area and Barrier Details	**Stakeholders Impacted and/or Involved**
4. Institutional Barriers: The following barriers can impact code enforcement offices, designers, builders/contractors/building trades, residential home owners, building owners/operators, equipment and appliance manufacturers.	
A. Local code officials do not prioritize energy code enforcement **B.** Municipal officials do not prioritize energy code enforcement or support these efforts of code officials	Code enforcement offices, designers, builders/contractors/building trades, residential home owners, building owners/operators, equipment and appliance manufacturers

Table 1-3: Standards-Related Problems to be addressed by the Initiative

Problem Area and Barrier Details	Stakeholders Impacted and/or Involved
1. Technical Barriers: The following barriers can impact equipment and appliance manufacturers, distributors or retailers, environmental and efficiency advocates, consumer advocacy groups, and health and safety organizations, as well as NYSERDA and the US Department of Energy.	
a. Increasingly short product life cycles outpace standards-setting processes and thus create uncertainty regarding products' energy efficiency b. Need for well thought through and clearly articulated product scopes and definitions. Product scopes or definitions lacking information or clarity, or poorly chosen ones, result in unintentional excluding and including of products c. Lack of data with respect to test results identifying energy efficiency performance of products d. Lack of comprehensive [2] information on technology options resulting in efficiency improvements over the baseline product e. Outdated or non-existent standardized testing protocols on what gets measured and how to measure it	Equipment and appliance manufacturers, distributors or retailers, environmental and efficiency advocates, consumer advocacy groups, health and safety organizations NYSERDA US DOE

[2] Examples of such information include energy performance, commercial availability, practicality to manufacture, install and service, reliability, service life, and adverse health or safety impacts.

Problem Area and Barrier Details	**Stakeholders Impacted and/or Involved**
2. Economic Barriers: The following barriers can impact equipment and appliance manufacturers/distributors/retailers, and consumers, as well as NYESRDA and the US Department of Energy.	
a. Increased stringency of new standards is seen as a significant cost by manufacturers b. Increased first cost is a burden on distributors, retailers, and consumers c. Lack of data on the incremental costs [3] of the higher efficiency product options d. Lack of market data on the distribution of products manufactured or sold by efficiency characteristics e. Manufacturer concern with states establishing different standard levels for products	Equipment and appliance manufacturers/distributors/retailers, consumers NYSERDA US DOE
Problem Area and Barrier Details	**Stakeholders Impacted and/or Involved**
3. Informational Barriers: The following barriers can impact equipment and appliance manufacturers, NYSERDA staff and contractors, as well as the US Department of Energy and consumers.	
a. Unknown applicability of out-of-state research to New York circumstances, or lack of New York State specific information where it may be different b. Misconceptions by consumers on standards impacts with respect to purchasing choices c. Manufacturer concern with burden of submitting information to demonstrate product compliance to multiple states with potentially different standards level requirements	Equipment and appliance manufacturers NYSERDA staff and contractors US DOE Consumers
Problem Area and Barrier Details	**Stakeholders Impacted and/or Involved**
4. Institutional Barriers: The following barriers can impact Equipment and appliance manufacturers/distributors/retailers, as well as NYSERDA staff and contractors.	
a. Entrenched interests are not eager for public comment to influence product development processes b. Rulemaking may take longer than product lifecycle c. National standards setting processes have an increasing number of diverse voices, thus increasing the importance for states such as New York to represent its needs d. Lack of enforcement infrastructure at the state level e. Lack of enforcement for on-line purchases	Equipment and appliance manufacturers/distributors/retailers NYSERDA staff and contractors

[3] Incremental costs include installation, or operation and maintenance costs.

Section 2:

INITIATIVE OBJECTIVES (HIGH LEVEL)

The Advanced Codes and Standards Initiative has the following objectives:

2.1 ENERGY CODE –SHORT-TERM/INTERMEDIATE-TERM (1 – 4 YEARS)

- Increase the (actual) statewide code compliance rate to the federally-mandated 90% or above
- Explore and test alternative code approaches to improved enforcement and implementation
- Evaluate code-ready, energy-saving technologies and new construction materials and assemblies in the context of resiliency, durability, and building science
- Explore regulatory means to extend energy-saving approaches to more existing buildings
- Improve integration of new approaches for "above minimum" codes and green planning for localities
- Prepare the marketplace and the design and construction communities for advancing code requirements and technical/manufacturing innovations
- Clarify building energy codes for both code enforcement officials and the design and construction community
- Enhance website to become primary source for energy code-related information for New York State building trades, code enforcement officials, and design professionals

2.2 ENERGY CODE – LONG-TERM (5 + YEARS)

- Promote adoption of proven alternative compliance and enforcement systems
- Promote adoption of proven energy-saving technical provisions, including those incorporating durability and new technologies
- Expand energy provisions in codes for existing buildings
- Advance "above minimum" codes, net zero energy buildings, and green planning principles
- Facilitate the integration of code advances into the marketplace
- Improve the alignment of New York State's requirements with national codes and reference standards revised on three-year cycles

2.3 APPLIANCE STANDARDS – SHORT-TERM/INTERMEDIATE-TERM (1 – 4 YEARS)

- Prioritize appliance and equipment standards opportunities for energy savings
- As needed, evaluate and test products and equipment to understand and support standards opportunities
- Actively participate in the federal rulemaking processes for selected appliance and equipment standards
- Support and facilitate the establishment of appropriate state appliance and equipment standards

2.4 APPLIANCE STANDARDS – LONG-TERM (5 + YEARS)

- Support timely enactment and implementation of appliance and equipment standards
- Identify and analyze the potential impact of appliance and equipment standards on the New York market

Section 3:

INITIATIVE RESOURCES

This section identifies the dollar, workforce, and partnership, etc., that resources programs are providing under this initiative.

Table 3-1: Initiative Resources

SBC-IV Funding
• $16.7 Million to fund contracted activities
NYSERDA Staff Resources
• 2 FTE
External Resources
• New York DOS • Pacific Northwest National Labs • Department of Energy (DOE) – Appliance Standards and Awareness Program • Department of Public Service • Northeast Energy Efficiency Partnership • New York State Building Officials Conference
Intangible Resources
• NYSERDA reputation for effective program management • DPS reputation for effective advocacy of energy efficiency policy

Section 4:

INITIATIVE ACTIVITIES

This section provides a description of code and standards activities

4.1 BUILDING CODES

Code activities fall into four major categories:

1. **Annual Statewide Code Compliance Assessments** – NYSERDA has selected a contractor to conduct the first SBC IV statewide code compliance assessment study to measure the compliance rate of the 2010 state energy code. This full comprehensive statewide compliance study will identify rates of code compliance and associated energy impacts. Lessons learned through the first phase of this compliance assessment will inform the design of future assessments, which will, in turn, inform future allocation of NYSERDA resources.

   The initial phase of compliance assessments will establish evaluation methods applicable to all project types, and will focus on commercial renovation projects.

2. **Development and Delivery of Advanced Training** – Training to support new and advancing codes and standards is critical, particularly at points of adoption. Training efforts for codes will build upon those developed using ARRA funds, with new or enhanced training modules and approaches. The modules will focus on topics including code changes with the greatest significance to the design and construction communities; building science and equipment; inspection; and enforcement options including using third-party personnel. NYSERDA will provide both in-person and on-line training, with sessions ranging from introductory to expert-level content tailored for each intended audience. Site-specific and hands-on-training are also likely.

   Training will focus on in-person training – both classroom sessions and alternative approaches - as proposed by implementation contractors. Online training efforts will include upgrades of existing curricula, as well as development of new modules.

   NYSERDA will plan and deliver symposium or conference(s) associated with code efforts (see Outreach below). For delivery of training and tools, NYSERDA will primarily use competitive solicitations and seek innovative strategies that reach broad audiences. Online training will be used to complement in-person, classroom training.

3. **Technical Support, Studies, and Tool Development** – NYSERDA will competitively select technical consulting firms to provide the support and objective review necessary for consideration of codes and standards changes and for implementation of new strategies. Examples of potential study topics include the following:

   - Analysis or testing of products or equipment to determine suitability and cost-effectiveness of proposed codes
   - Collecting and analyzing data on New York State market conditions for proposed codes or equipment standards
   - Evaluation of the cost-effectiveness of advancing codes

- Identification of barriers facing new code-related products that are deemed ready for the marketplace (complementary to other NYSERDA initiatives supporting market research targeting experimental and emerging products)
- Examination of the effectiveness of codes and standards training efforts
- Third-party regulatory and administrative support
- Innovative approaches to plan review and inspection support for code officials
- Development of a code enforcement manual

NYSERDA will complete publications supporting increased compliance to improve access to code-related information and to facilitate submission or review of compliance documentation. Examples include the ARRA-prepared *Code Commentary* in 2013 and 2014 to coincide with scheduled code changes; completion of the ARRA-funded contractors' (2011) *Field Guide*; and a Code Enforcement Manual for code officials.

NYSERDA and the New York DOS also will participate in national and regional codes development efforts. Examples of code activities include attending the International Code Council Model Energy Code and Green Construction Code Hearings, as well as participating in regional code working group meetings and working with efficiency advocates, manufacturers, and other stakeholders to develop or support consensus language for particular code issues.

In addition to codes support activities, NYSERDA will provide direct municipal support to local jurisdictions through competitively solicited programs, including innovative programs to be piloted in select jurisdictions. This may include, and then test, new implementation and business models for appliance and equipment standards, improved code compliance and enforcement strategies, and "above minimum" and green planning efforts. Qualified contractors would implement these tests on behalf of NYSERDA. Examples of potential pilots include the following:

- Innovative approaches to reaching new markets
- Innovative opportunities to increase the effectiveness of energy-related efforts at local and state agencies
- Implementation strategies for adoption of "above minimum" codes and green planning strategies
- Alternate/supplemental approaches to local energy code enforcement
- Pilot programs (e.g. plan review, specialized training) for select communities

4. **Outreach** – NYSERDA will conduct outreach activities to the design and construction communities, as well as code officials, via the following channels:

- An enhanced website that will provide definitive and easily accessible code information
- Sponsorship and management of public events (e.g., conferences) where participants can learn about code developments and intended applications
- Increased public contact by initiative staff with the design and builder community, as well as local code officials

- Marketing material describing the initiative's events and resources

4.2 EQUIPMENT AND APPLIANCE STANDARDS

Standards initiative activities fall into two categories:

1. **Advocacy** – NYSERDA and the New York DOS will participate in state and federal rulemaking processes to support appliance and equipment standards that cost-effectively deliver energy efficiency, taking into account market availability. Where opportunities arise, NYSERDA will coordinate with other stakeholders, such as manufacturers, retailers, and consumer advocates and will join in encouraging the adoption of standard level(s) that cost-effectively deliver energy savings and environmental benefits to New York State.

   NYSERDA and the New York DOS also will participate in national and regional standards development efforts both by attending DOE public hearings and by submitting comments to rulemakings for appliance and equipment standards. Examples of standards activities include evaluation of technical issues, providing New York-specific information on market conditions, and quantifying anticipated impacts to New York.

   As needed, NYSERDA may develop consumer messages to address and overcome misconceptions in the marketplace on upcoming appliance and equipment standards.

2. **Testing and Research** – NYSERDA will competitively select and contract with qualified technical consulting firms to develop estimates of energy savings and costs associated with more energy efficient appliances and equipment. These estimates and supporting documentation will vary depending on whether the standard is intended for state or federal rulemaking. Informational deliverables from these service providers may include:

   - Definition of the characteristics of the market
   - Identification of baseline products in terms of efficiency performance
   - Assessment of the current and potential spread of efficiency, standards level, market availability and penetration in New York State, cost effectiveness, any consumer utility features or requirements (e.g., safety features)
   - Recommendations regarding appropriate testing procedures and energy performance results
   - Assessment of conformance to selected state or federal product standards.

   Products with higher energy impacts and greater likelihood of non-compliance will receive the greatest focus in baseline assessments.

   Further, NYSERDA will ensure that recent tools, including the online product certification Multistate Compliance Database (originally developed with NYSERDA participation), are updated and appropriate to New York. NYSERDA will also conduct assessments for emerging technologies that may be applicable to residential and commercial ratepayers in New York. NYSERDA will provide these estimates and assessments to state and federal rulemaking processes to inform decisions in those processes.

   - Analysis or testing of products or equipment to determine suitability and cost-effectiveness of proposed equipment standards
   - Collecting and analyzing data on New York market conditions for equipment standards

- Ensuring easily accessible, New-York-State-appropriate tools are available for manufacturers for product certification

Section 5:

INITIATIVE OUTPUTS

This section describes the anticipated immediate results (i.e., outputs) associated with initiative activities. Table 5-1 describes the outputs for codes activities, and Table 5-2 describes the outputs for standards activities.

Table 5-1: Outputs, Indicators, and Potential Data Sources for Code Activities

Outputs	Indicators	Data Sources and Potential Collection Approaches
1. Outputs from Development and Delivery of Advanced Training Activities		
a. Delivery of in-person training via both traditional and alternative methods to target audiences	Number of trainees completing coursework (both traditional and alternative paths)	Review of program tracking database
b. Delivery of on-line materials to target audiences	Number of attendees receiving on-line materials	Review of program tracking database and web analytics
Outputs	**Indicators**	**Data Sources and Potential Collection Approaches**
2. Outputs from Technical Support, Studies and Tool Development Activities		
a. Code references, technical studies, and staff support	Number of references and technical studies completed and distributed. Number of FTE (staff equivalents) devoted to code initiative	Review of program tracking database; review of references/studies; and staff count devoted to code initiative
b. Direct Municipal programs and enforcement	Number of communities reached Number of pilot programs initiated and completed Number of tools delivered	Review of program tracking databases and program documentation; review of enforcement tools
c. Code commentary and field guide	Delivery of commentary and field guide in 2013/2014	Review of distribution plan and explanatory narrative
Outputs	**Indicators**	**Data Sources and Potential Collection Approaches**
3. Outputs from Outreach Activities		
a. Enhanced website, initiative marketing and public contact	Completion of website upgrade Number of marketing and public contacts (2014 – 2017)	Multiple comparisons of old to new website as it evolves from version to version; Review of marketing and public contacts tracking system
b. Sponsorship and management of symposium or conference event(s)	Number/scale/content of events sponsored, planned and implemented	Review of event documentation and attendee lists

Outputs	Indicators	Data Sources and Potential Collection Approaches
4. Outputs from Annual Statewide Compliance Assessments		
a. Establish codes and standards evaluation methods	Establishment of new codes evaluation methods by year-end 2013 Establishment of new standards evaluation method by year-end 2013	Review of methodologies
b. Ongoing studies based upon previous assessment efforts	Number of studies completed and published	Review of publicly available reports

Table 5-2: Outputs, Indicators, and Potential Data Sources for Standards Activities

Outputs	Indicators	Data Sources and Potential Collection Approaches
1. Outputs from Advocacy Activities		
a. Participation state and federal in rulemaking processes	Number of rulemaking events in which NYSERDA participates	Review of program documentation and communications
b. Coordination with Stakeholders	Number of coordination events Protocols defining roles in activities	Review of program documentation of events Review of protocols
Outputs	**Indicators**	**Data Sources and Potential Collection Approaches**
2. Outputs from Testing and Research		
a. Data-supported estimates of energy savings and costs for more stringent standards	Number of research reports implemented	Review of publicly available documentation
b. Assessments of emerging appliance and equipment technologies and their applicability to the NY market	Number of assessment reports implemented	Review of publicly available documentation

Section 6:

INITIATIVE OUTCOMES AND LOGIC DIAGRAMS

Table 6-1 details the initiative's expected achievements (i.e., outcomes) for codes, as well as the observable indicators that would signify the presence of these achievements. In addition, the table shows the data sources and potential collection approaches that an evaluation effort might undertake to determine the achievement of the expected outcomes. Table 6-2 provides similar information for standards.

Table 6-1: Outcomes, Indicators, and Potential Data Sources for Codes Activities

Outcomes	Indicators	Data Sources and Potential Collection Approaches
1. Short-Term Outcomes from Development and Delivery of Training Activities		
a. More knowledgeable code officials and design & construction communities	Number of targeted training participants able to demonstrate knowledge of code changes and appropriate application to review of plans and inspection of buildings Increased code compliance	Test-based certification, survey of targeted participants, greater compliance
Outcomes	**Indicators**	**Data Sources and Potential Collection Approaches**
2. Short-Term Outcomes from Technical Support, Studies and Tool Development Activities		
a. Code officials and design & construction professionals are better able to implement energy code requirements	Number of technical support recipients who properly apply energy code to design and construction reviews Increased code compliance	Survey of targeted participants, greater compliance
b. Technical support informs and supports internal programs and policy	Adjustment of programs and policies (2013 – 2017) in response to technical support efforts	Interviews with policymakers and program managers; review of program/policy documentation
Outcomes	**Indicators**	**Data Sources and Potential Collection Approaches**
3. Short-Term Outcome from Outreach Activities		
a. Increased participation in Energy Code Training	Number of code officials and design & construction professionals who take part in training	Longitudinal review of program tracking data
b. Website becomes a comprehensive energy code resource	Numbers of code officials and design & construction professionals using the website	Review of web analytics and web-survey of code officials and design and construction professionals

Outcomes	Indicators	Data Sources and Potential Collection Approaches
4. Short-Term Outcomes from Annual Statewide Compliance Assessments		
a. Improved understanding by NYSERDA and the New York DOS staff of code compliance rates and energy savings impacts	Number of program elements that NYSERDA adjusts based on assessment results	Review of compliance assessments; staff interviews
Outcomes	**Indicators**	**Data Sources and Potential Collection Approaches**
5. Intermediate Outcomes		
a. Construction of more energy efficient buildings through compliance with energy code	Number of code-compliant buildings	Longitudinal review of Annual Statewide Compliance Assessments
b. A more stringent and usable Energy Code	Increase in stringency in future energy codes; increase in compliance rates	Comparison of previous code to new code; surveys of code officials and the design & construction community; results of Annual Compliance Assessments
c. More efficient and effective methods of compliance evaluation	Evaluators test new methods and establish efficacy from year to year	Comparison and analysis of previous methods to new methods
Outcomes	**Indicators**	**Data Sources and Potential Collection Approaches**
6. Longer-Term Outcomes		
a. 90% + energy code compliance achieved by 2017	Rate of code compliance	Longitudinal review of Annual Statewide Compliance Assessments
b. Increasing energy savings	Declining energy use per square foot of the built environment	Impact analysis based on compliance assessments

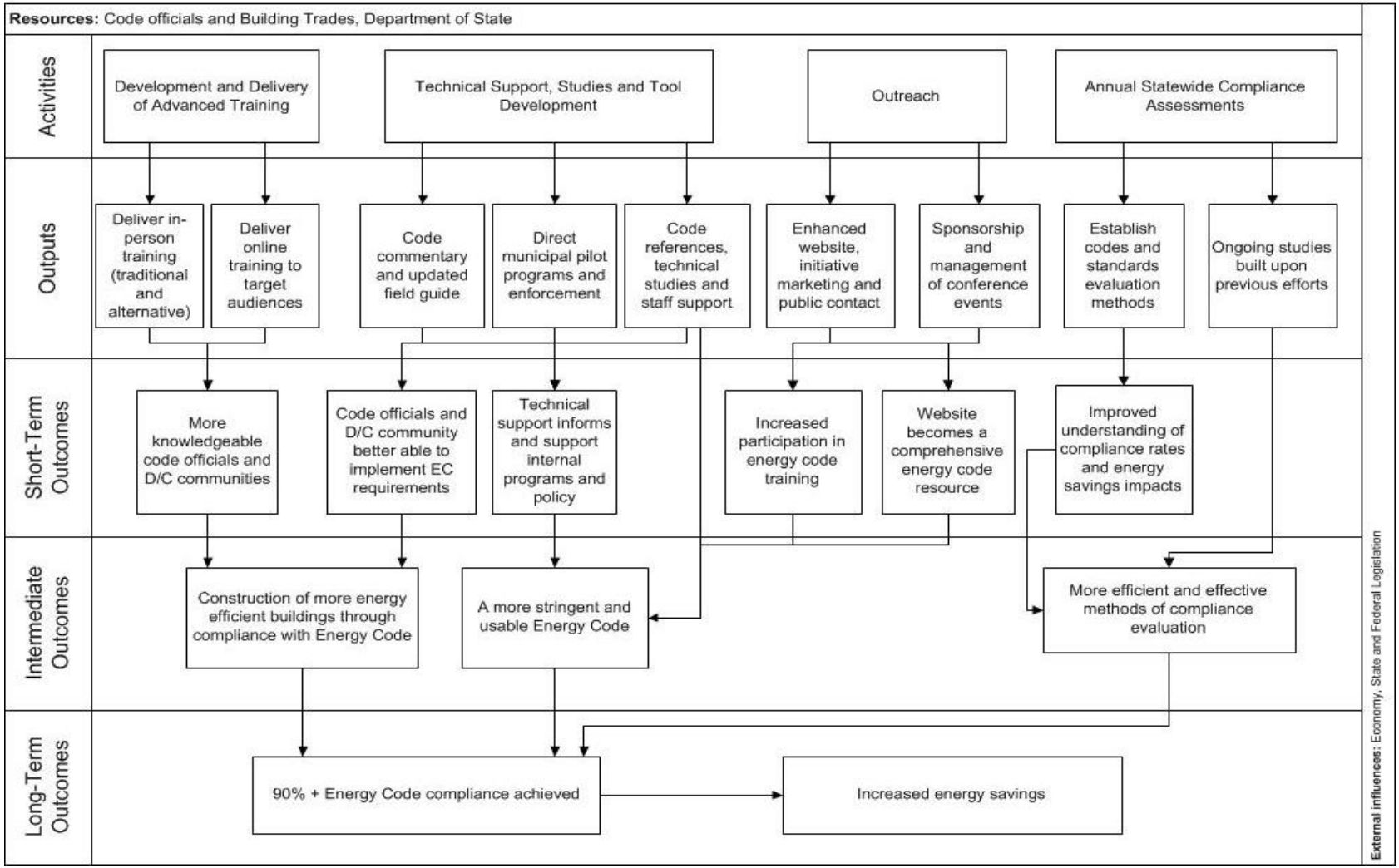
Table 6-2: Outcomes, Indicators, and Potential Data Sources for Standards Activities

Outcomes	Indicators	Data Sources and Potential Collection Approaches
1. Short-Term Outcomes from Advocacy Activities		
a. Federal and State rulemaking processes consider increased stringency	Rule-making processes reflect NYSERDA-recommended standards	Review of rulemaking proceedings, testimony and decisions

Outcomes	Indicators	Data Sources and Potential Collection Approaches
2. Short-Term Outcomes from Testing and Research Activities		
b. More objective information is available to rulemaking processes	NYSERDA-supplied estimates and assessments are consistently included in materials supplied to rulemaking process	Review of rulemaking proceedings, testimony and decisions
Outcomes	**Indicators**	**Data Sources and Potential Collection Approaches**
3. Intermediate Outcomes		
a. Rule-making processes adopt more stringent appliance and equipment standards	NYSERDA-recommended standards are consistently included in final rulemaking	Review of program documentation and record of final rulemaking
Outcomes	**Indicators**	**Data Sources and Potential Collection Approaches**
4. Longer-Term Outcomes		
b. Energy savings, improved environmental quality, and increased economic activity	Meeting or exceeding annual energy savings goals	Impact analysis based on testing results and market data

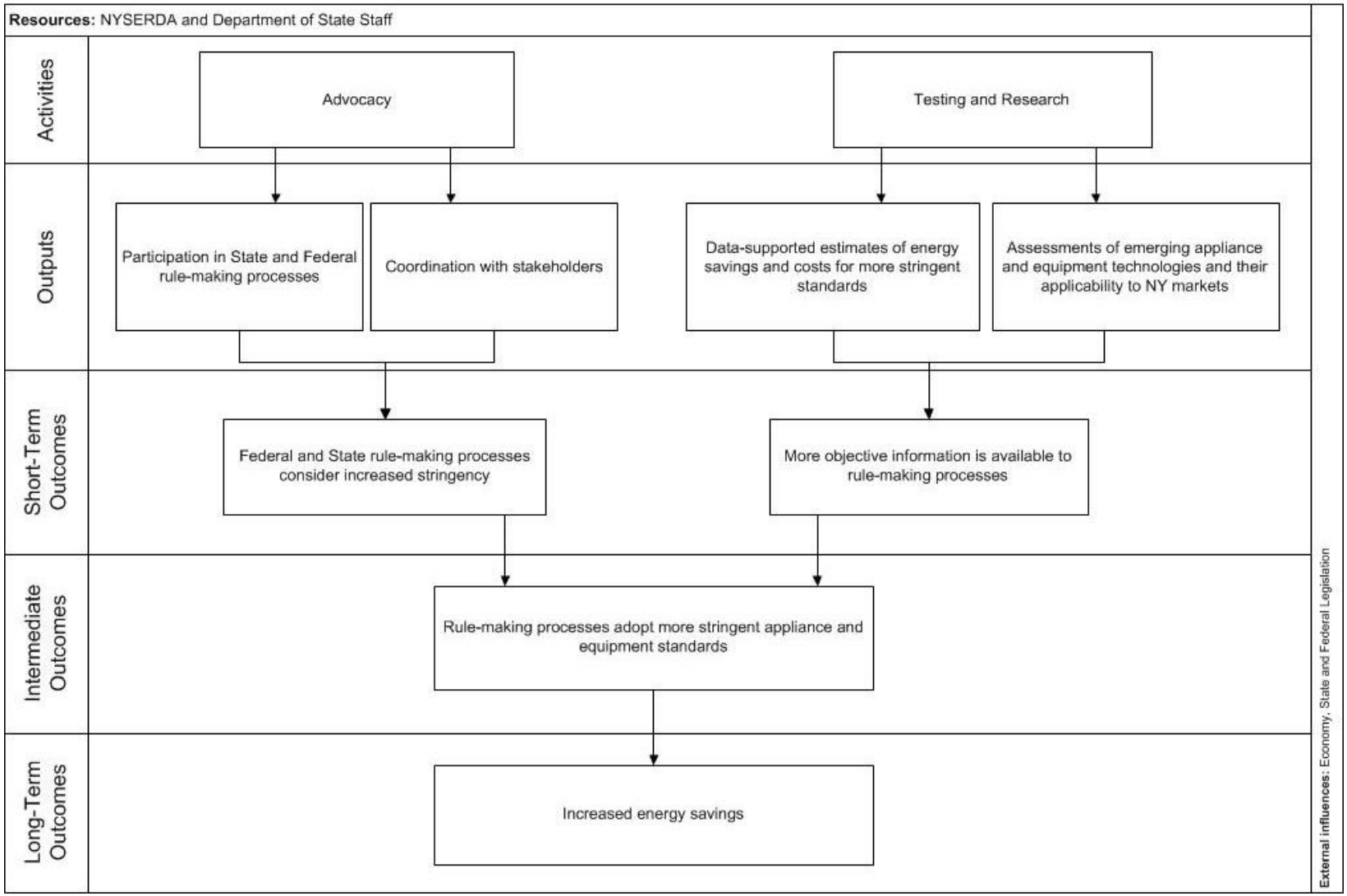
The following pages present NYSERDA's Advanced Codes and Standards Initiative logic model diagrams (Figure 6-1 for codes components of the program and Figure 6-2 for standards components of the program) showing the linkages between activities, outputs, and anticipated outcomes. The diagram presents key features of the initiative including Initiative Resources (Inputs) and potential External Influences. The logic diagrams presented here are at a slightly higher level than the tables in this report, aggregating some of the outcomes in order to provide easier-to-read logic models.

Figure 6-1: Advanced Codes Logic Diagram



D/C: Design & Construction

Figure 6-2: Standards Logic Diagram



Section 7:

ASSUMPTIONS ABOUT THE INITIATIVE

This section describes the testable hypotheses or testable assumptions about the program to be explored in the evaluations.

The testable hypotheses for the Advanced Codes and Standards Initiative include the following:

1. If policymakers have information from code compliance assessments, they will change codes and standards to favor increased energy efficiency in the built environment and among appliances and equipment.

    a. Did awareness activities and outputs occur as planned?

    b. Did the annual compliance assessments occur as planned?

    c. Did the compliance assessment results increase the knowledge and inform the decisions of policymakers?

    d. Did policymakers apply lessons learned to energy efficiency opportunities outside of building codes?

2. If code officials have better training, code compliance rates will increase – leading to electric and gas energy savings.

    a. Did training activities and outputs occur as planned?

    b. Did the initiative activities increase compliance rates?

    c. Were code enforcement officials and design and construction professionals better able to implement energy code changes?

    d. Did increased compliance result in electric and other fuel energy savings?

    e. Did increased compliance lead to design and construction practices that exceeded state building codes in effect at the time of permitting?

3. Advocacy and technical support will increase stringency of appliance standards and lead to greater energy efficiency of appliances and equipment.

    a. Did advocacy and technical activities and outputs occur as planned?

    b. Did the initiative activities increase stringency of standards?

    c. Did increased stringency lead to greater energy efficiency among appliances and equipment?

    d. Did increased stringency lead to appliance or equipment designs that exceeded that of the standard in effect at time of manufacture?

    e. Did increased stringency of the standard for one product category lead to more efficient design and manufacture of other appliance or equipment types?

4. Technical support will increase code awareness and enforcement effectiveness.
    a. Did technical support activities and outputs occur as planned?
    b. Did the technical support lead to an enhanced energy code?
    c. Did the initiative activities increase code awareness and enforcement effectiveness?
5. Increased outreach to design and construction professionals, as well as the public at large, will lead to more efficient and effective evaluation methods and achieve greater compliance to the energy code.
    a. Did the outreach activities and outputs occur as planned?
    b. Did the outreach activities increase training participation?
    c. Did the website become a comprehensive code resource?
    d. Did the outreach efforts lead to an enhanced energy code?
    e. Did increased compliance lead to design and construction practices that met state building codes in effect at the time of permitting?
6. Pilot project results can be transferred to other New York jurisdictions and scaled up for broader application.
    a. Did pilot project activities and outputs occur as planned?
    b. Were pilot project results transferred to other New York jurisdictions and scaled up for broader application?
    c. Did the pilot project results lead to an enhanced energy code?
    d. Did the pilot project results lead to increased compliance rates?
    e. Did the pilot project accelerate the adoption of energy efficient products or practices prior to implementation of a specific code?
    f. Is any of this transference taking place without NYSERDA, or other state agency, support?
7. Program influenced actions can result in quantifiable energy savings.
    a. Have municipalities developed and implemented local energy codes that exceed the stringency of New York energy code?
    b. Have designers and builders developed residential or commercial projects that met New York energy code without further NYSERDA support or assistance?
    c. Have municipalities developed a policy to commit to higher energy code compliance?

Section 8:

EXTERNAL INFLUENCES

The primary external influences upon the Advanced Codes and Standards Initiative will be the economic health of the nation at large and the State of New York, as well as federal legislation and regulation.

Economy – Economic conditions will drive residential and commercial building rates that, in turn, will determine the overall opportunity to achieve savings in new construction. It is possible that the initiative could achieve its goal of increasing compliance in a slow-growing market. In this instance, the initiative's hypothesis could prove true, but the lack of construction would limit actual savings.

In addition, economic conditions will influence code enforcement resource levels. Since taxes and fees fund code enforcement officials and their infrastructure, any further decline in economic activity could limit the effects of this initiative.

Federal and State Legislation – While input from New York State has shaped standards and specification setting results at a national level, more and more interveners are taking part in these processes. Depending on the outcome of future elections, the opportunities for New York to influence standards and specifications may expand significantly, or be curtailed entirely. Similarly, changes in state legislation to strengthen or weaken equipment and appliance standards would have a profound effect upon the overall impact of this initiative.

Section 9:

REFERENCES

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