

Department of Energy and Environment

Evaluation, Measurement, and Verification of Energy Efficiency and Renewable Energy Programs in the District of Columbia

FY15 Annual Evaluation Report Volume II—Appendices (Final Draft)

April 15, 2016





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ACKNOWLEDGEMENTS

This evaluation effort was performed by Tetra Tech, GDS Associates, Leidos, and Baumann Consulting Engineers under the leadership of Tetra Tech. GDS Associates led and completed the cost effectiveness testing.

This effort has been supported by the provision of project data in the form of KITT data extracts, project files, memos, staff interviews, and responses to other requests for data and information by the DOEE, DCSEU and VEIC.

The evaluation team thanks the DOEE, DCSEU and VEIC teams for their timely responses to all data requests and follow-up questions.

ACRONYMS

AC	Air conditioner
Btu	British thermal unit
C&I	Commercial and institutional
CAT	Custom application tool
CATI	Computer assisted telephone interview
CBE	Certified business enterprise
CF	Coincidence factor
CEI	Comprehensive efficiency improvements
CFL	Compact fluorescent lamp
CLEER	Commercial lighting energy efficient replacement
DI	Direct install
DCSEU	District of Columbia Sustainable Energy Utility
DOEE	Department of Energy and Environment
DHW	Domestic hot water
EC	Energy consultant
ECM	Energy conservation measure
EFI	Energy Federation Incorporated
EFLH	Equivalent full load hours
E&B	Ebert and Baumann Consulting Engineers
EM&V	Evaluation, measurement, and verification
FAQ	Frequently asked question
FY	Fiscal year
Gpm	Gallons per minute
GWh	Gigawatt hour
HERO	Home energy reporting online
HPwES	Home Performance with ENERGY STAR®
HVAC	Heating ventilation and air conditioning
ICDI	Implementation contractor direct install
KITT	Knowledge information transfer tool
kW	Kilowatt
kWh	Kilowatt hour
LED	Light emitting diode
LI	Low-income
LIMF	Low-income multifamily
mcf	1,000 cubic feet
MF	Multifamily



MMBtu	1 million British thermal unit
M&V	Measurement and verification
N	Population
n	Sample
NREL	National Renewable Energy Laboratory
NTG	Net-to-gross
PJM	Pennsylvania New Jersey Maryland
PMDI	Property manager direct install
PV	Photovoltaic
PY	Plan year
QA/QC	Quality assurance/quality control
QS	Quick start
RFP	Request for proposal
RPM	Reliability pricing model
REIP	Renewable Energy Incentive Program
RR	Realization rate
SFQS	Single family quick start
SOME	So others might eat
SR	Standard rebates
SREC	Solar renewable energy certificate
SRI	Standard rebate initiative
TRM	Technical reference manual
Tt	Tetra Tech
VEIC	Vermont Energy Investment Corporation
VFD	Variable frequency drive

APPENDIX A: SITE VISIT NOTIFICATION LETTER

GOVERNMENT OF THE DISTRICT OF COLUMBIA
Department of Energy and the Environment



[DATE]

[ID: xxxx]

[NAME]
[Address Line 1]
[Address Line 2]

Dear [NAME],

The Department of Energy and the Environment (DOEE) has hired Tetra Tech, a professional evaluation and research firm, to evaluate the District of Columbia Sustainable Energy Utility (DC SEU) energy efficiency programs. The purpose of this evaluation effort is to understand how these programs are operating and to verify equipment installations.

Within the next few weeks, you may receive a telephone call from Tetra Tech to schedule a visit in order to review the equipment installed through the program.

If you have any questions about the purpose of the study or its use, please feel free to contact Lance Loncke at (202) 671-3306. If you would like to call Tetra Tech to schedule a site visit at your convenience, feel free to call (800) 454-5070. In either case, please refer to your ID number at the top right corner of this letter.

Thank you in advance for your help with this important study.

Sincerely,

Lance Loncke, Ph.D.
Associate Director, DOEE



1200 First St. NE, 5th Floor, Washington, DC 20002 | Tel: (202) 535-2600 | web:doee.dc.gov





APPENDIX B: CUSTOM COMMERCIAL AND INSTITUTIONAL PARTICIPANT CUSTOMER SATISFACTION SURVEY INSTRUMENT

FY15 C&I Initiatives

(Tracks CIRX, MTV, CUST, MARO, NEWC) Customer Satisfaction (CSAT) Survey Instrument to be Conducted during Onsite Recruitment and Scheduling

Thank you again for your time today. I have a few questions about your experience to provide the DCSEU with information to help them identify ways to improve their program efforts.

- C1** First, will you please rate your level of satisfaction for each of the following items using a scale of 1 to 5, where 1 is 'not at all satisfied' and 5 is 'extremely satisfied'?

How satisfied were you with...?

___ [RECORD RESPONSE]

- 7 I'm not sure
- 8 Refused
- 9 Not applicable

[READ AND ROTATE LIST; RECORD 1 TO 5 FOR EACH]

- A** Your experience overall [do not rotate – always first]
- B** The rebate amount or financial incentive
- C** The technical assistance you received from the DCSEU [or their contractor], if applicable
- D** The application process
- E** The preapproval process, if applicable
- F** The amount of time it took to receive the rebate or financial incentive

- C2** [For each item rated <4] You gave a rating of [FILL with rating] for [insert C1 item]. Why was that?

[OPEN ENDED RESPONSES]

- C3** Did you work with an Energy Advisor from the DCSEU at any point during the planning or implementation of your project?

- 1 Yes
- 2 No (skip to C5)



7 I'm not sure (skip to C5)

C4 Would you describe the interaction with the DCSEU Energy Advisor as not at all helpful, not very helpful, somewhat helpful, or extremely helpful?

- 1 Not at all helpful
- 2 Not very helpful
- 3 Somewhat helpful
- 4 Extremely helpful
- 7 I'm not sure

C4a. Why do you say that?

[RECORD VERBATIM]

5. Would you contact DCSEU for assistance with future projects?

- 1 Yes
- 2 No [Why not?] *[RECORD VERBATIM]*
- 7 Not sure

END That's all the questions I have. I'd like to thank you for your help with this survey [and scheduling an onsite verification visit – AS PERTINENT].

APPENDIX C: SOLAR INITIATIVES CUSTOMER SATISFACTION SURVEY INSTRUMENT

FY15 Renewables

(Tracks PV and SHOT)

**Customer Satisfaction (CSAT) Survey Instrument to be Conducted during Onsite
Recruitment and Scheduling**

Thank you again for your time today. I have a few questions about your experience to provide the DCSEU with information to help them identify ways to improve their efforts.

R1 Is the electric solar panel system currently operating, or working?

- 1 Yes
- 2 No
- 7 I'm not sure
- 8 Refused

R1a [IF R1<>1] Why do you say that the electric solar panel system is not currently operating? *[RECORD VERBATIM]*

R2 Next, will you please rate your level of satisfaction for each of the following items using a scale of 1 to 5, where 1 is 'not at all satisfied' and 5 is 'extremely satisfied'?

How satisfied were you with...?

___ *[RECORD RESPONSE]*

- 7 I'm not sure
- 8 Refused
- 9 Not applicable

[READ AND ROTATE LIST; RECORD 1 TO 5 FOR EACH]

- A** Your experience overall [do not rotate – always first]
- B** The contractor performing the work
- C** [IF R1=1] The energy savings from the energy efficiency solar equipment
- D** [IF R1=1] The interconnection process with PepCo?

R3 [For each item rated <4] You gave a rating of [FILL with rating] for [insert R2 item].
Why was that? *[RECORD VERBATIM]*

END That's all the questions I have. I'd like to thank you for your help with this survey [and scheduling an onsite verification visit – AS PERTINENT].



APPENDIX D: INCOME ELIGIBLE CUSTOMER SATISFACTION SURVEY INSTRUMENT

FY15 Income Eligible Initiatives

(Tracks LIMF LICP, ICDI)

Customer Satisfaction (CSAT) Survey Instrument to be Conducted during Onsite Recruitment and Scheduling

Thank you again for your time today. I have a few questions about your experience to provide the DCSEU with information to help them identify ways to improve their efforts.

- L1** First, will you please rate your level of satisfaction for each of the following items using a scale of 1 to 5, where 1 is 'not at all satisfied' and 5 is 'extremely satisfied'?

How satisfied were you with...?

___ [RECORD RESPONSE]

- 7 I'm not sure
- 8 Refused
- 9 Not applicable

[READ AND ROTATE LIST; RECORD 1 TO 5 FOR EACH]

- A** Your experience overall [do not rotate – always first]
- B** The energy efficient equipment eligible or available through the program
- C** [FOR LICP] Incentive amount
- D** [FOR LICP] Amount of time it took to receive the incentive
- E** Interactions with the staff from DC SEU
- F** [FOR ICDI] The contractor who installed the equipment
- G** The performance of the new equipment

- L2** [For each item rated <4] You gave a rating of [FILL with rating] for [insert L1 item]. Why was that?

- L3** Was there any part of the process that you would you say was the most complicated or difficult? (For example, establishing eligibility, getting tenant buy-in, having the assessment completed, installing the equipment?)

- L4** Do you plan to utilize the program for other properties?



END That's all the questions I have. I'd like to thank you for your help with this survey [and scheduling an onsite verification visit – AS PERTINENT].



APPENDIX E: SOLAR PV AND THERMAL ON-SITE SURVEY INSTRUMENT

Residential Solar PV & Thermal Post Installation Inspection

Inspector's Name: _____ Date: _____

Participant's Name: _____ Phone: _____

_____/_____/_____

Physical Address: _____

City: _____ Zip: _____

Renewable Energy Project

☐ Solar Photovoltaic

Manufacturer: _____ Model Number:-

Solar collector Location: _____ Solar collector direction: _____ -

Solar collector capacity: _____ kW Number of solar collectors: _____

Array type: ☐ Fixed ☐ 1 or 2 Axis tilt

Axis tilt: _____ degrees Array azimuth: _____ degrees

Are you metering the output of the system?

☐ Yes ☐ No



If Yes, please record the available data: -

☐ **Solar Hot Water**

Manufacturer: _____ Model Number:-

Solar collector Location: _____ Solar collector direction:

Solar collector area: _____ sq. ft. Storage Volume: _____ gallons

Number of solar collectors: _____ Back-up heating fuel:

Was the old hot water heating system replaced? ☐ Yes ☐ No

Describe any differences from the equipment described in the project file and what is observed or verified onsite.

1. _____

2. _____



3.

4.

5.

-
-
-
-
-
-
-

General Questions

1. Have there been any changes to the project since it was installed?

If yes, please explain: _____

2. Are you satisfied with the performance of the renewable energy project and is it performing as expected?

☐ Yes ☐ No

If No, please explain: _____

3. Do you have a maintenance contract on the system that was installed?

☐ Yes ☐ No

• If Yes, please describe:-

•

4. If you had not received an incentive from the DC Sustainable Energy Utility would you still have considered undertaking the same renewable energy project?

☐ Yes ☐ No

If Yes, please explain:

5. Are you considering undertaking any additional renewable energy projects or expanding your current project?

☐ Yes ☐ No

If Yes, please explain:

6. Will you consider undertaking any additional renewable energy projects in the future without incentives from the DC Sustainable Energy Utility?

☐ Yes ☐ No

7. Were you satisfied with the workmanship of the equipment installer?

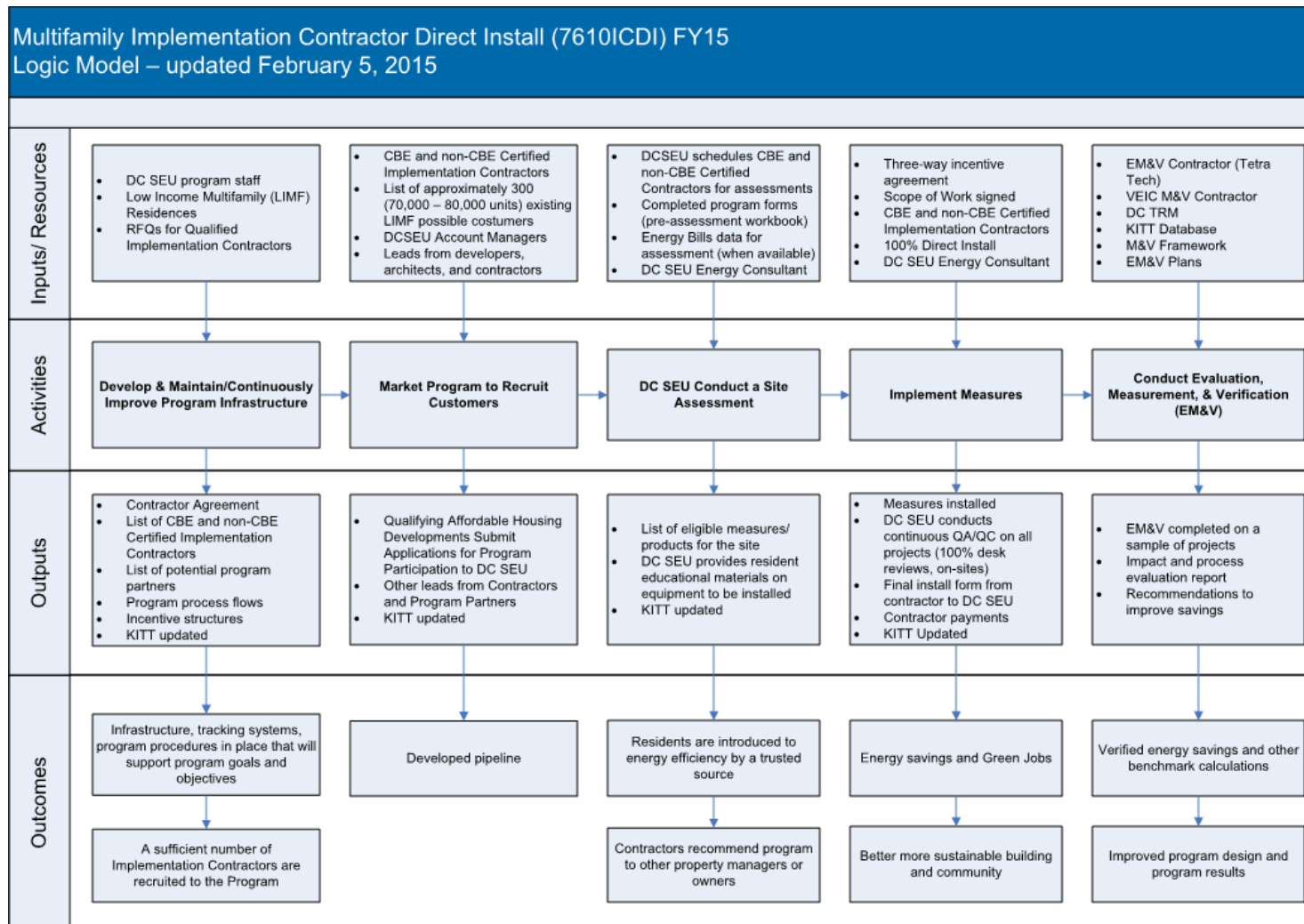
☐ Yes ☐ No

If No, please explain:-

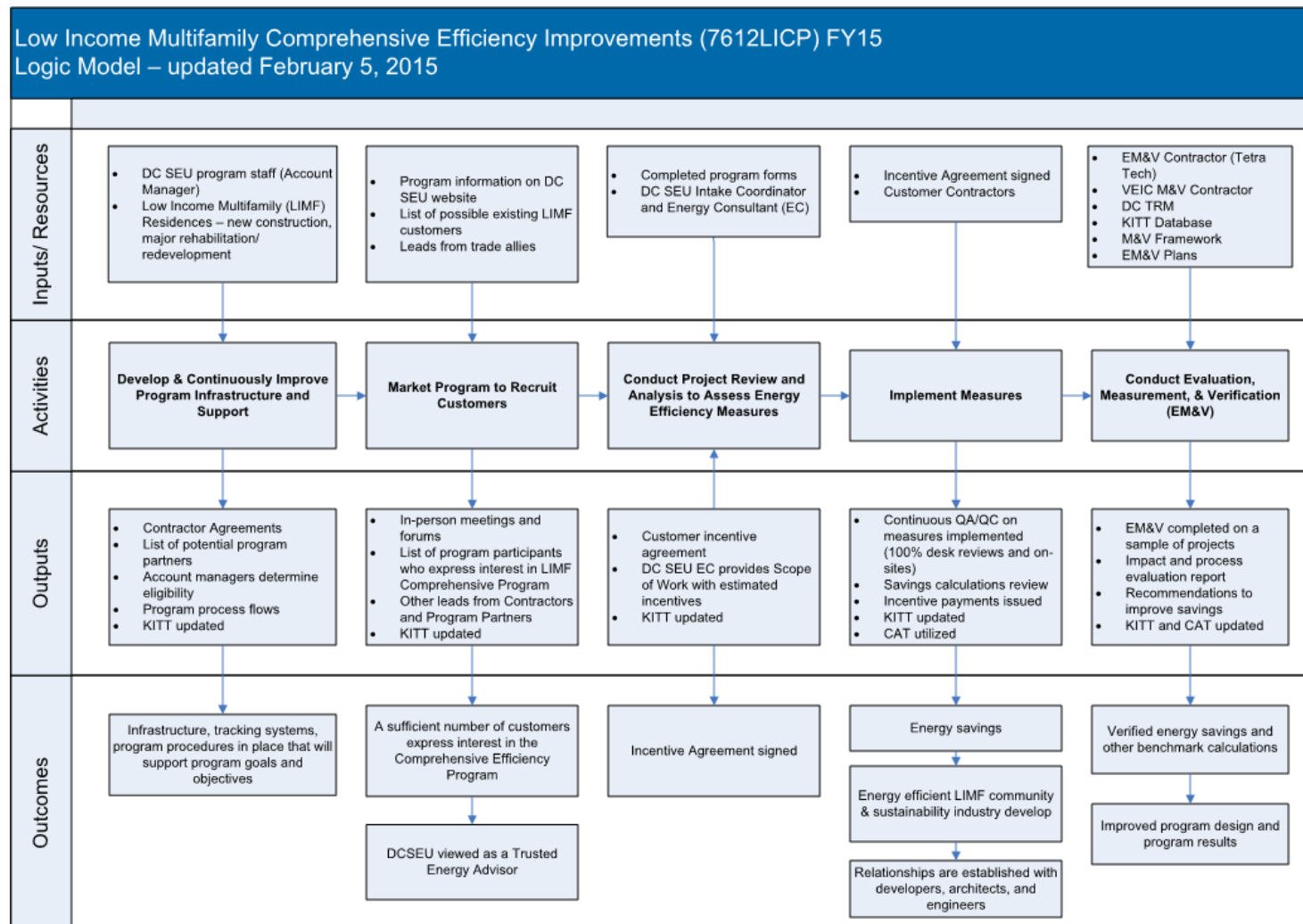
8. Is there anything you would like to tell us about your experience?

• -

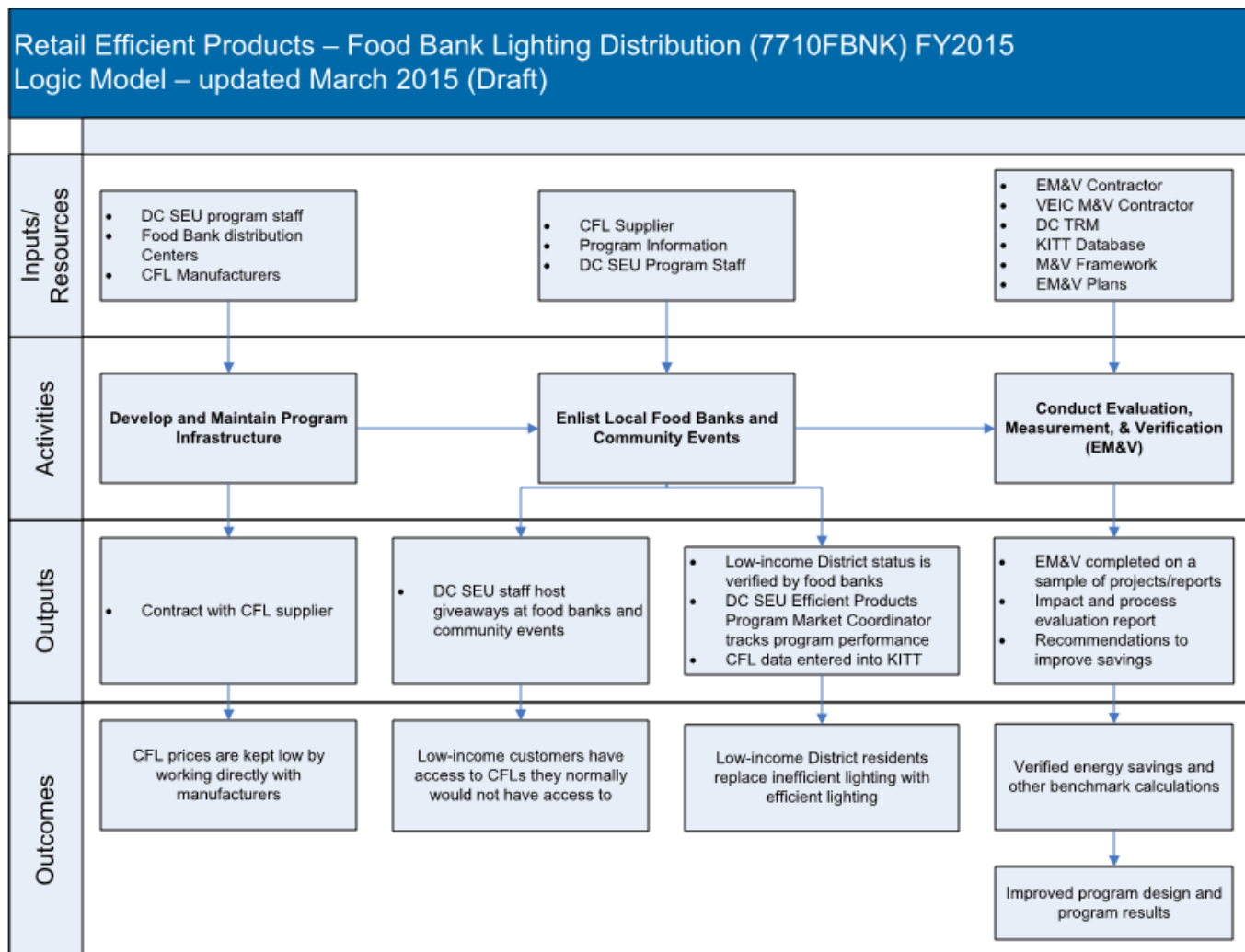
APPENDIX F: MULTI-FAMILY ICDI LOGIC MODEL



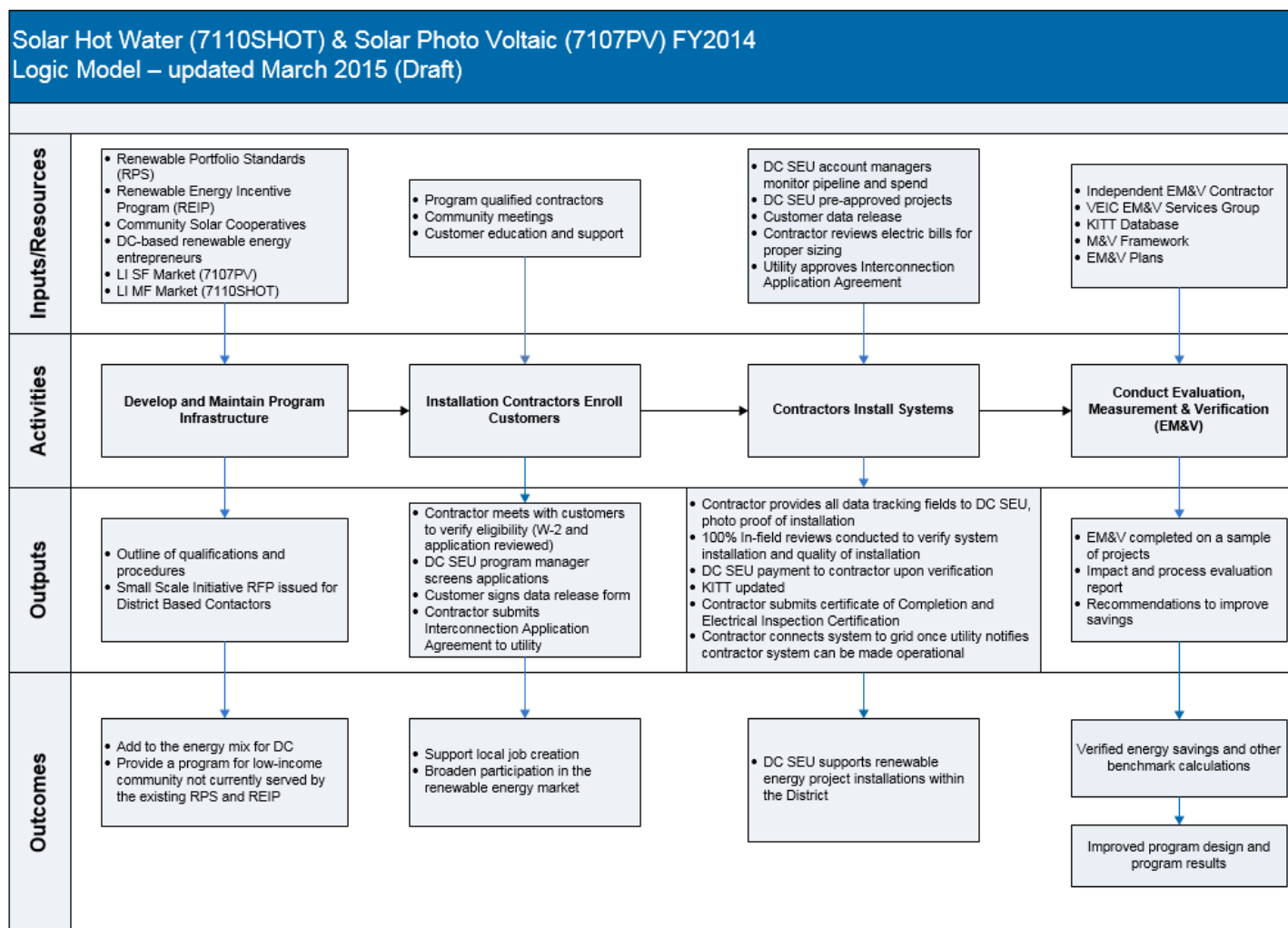
APPENDIX G: MULTI-FAMILY LICP LOGIC MODEL



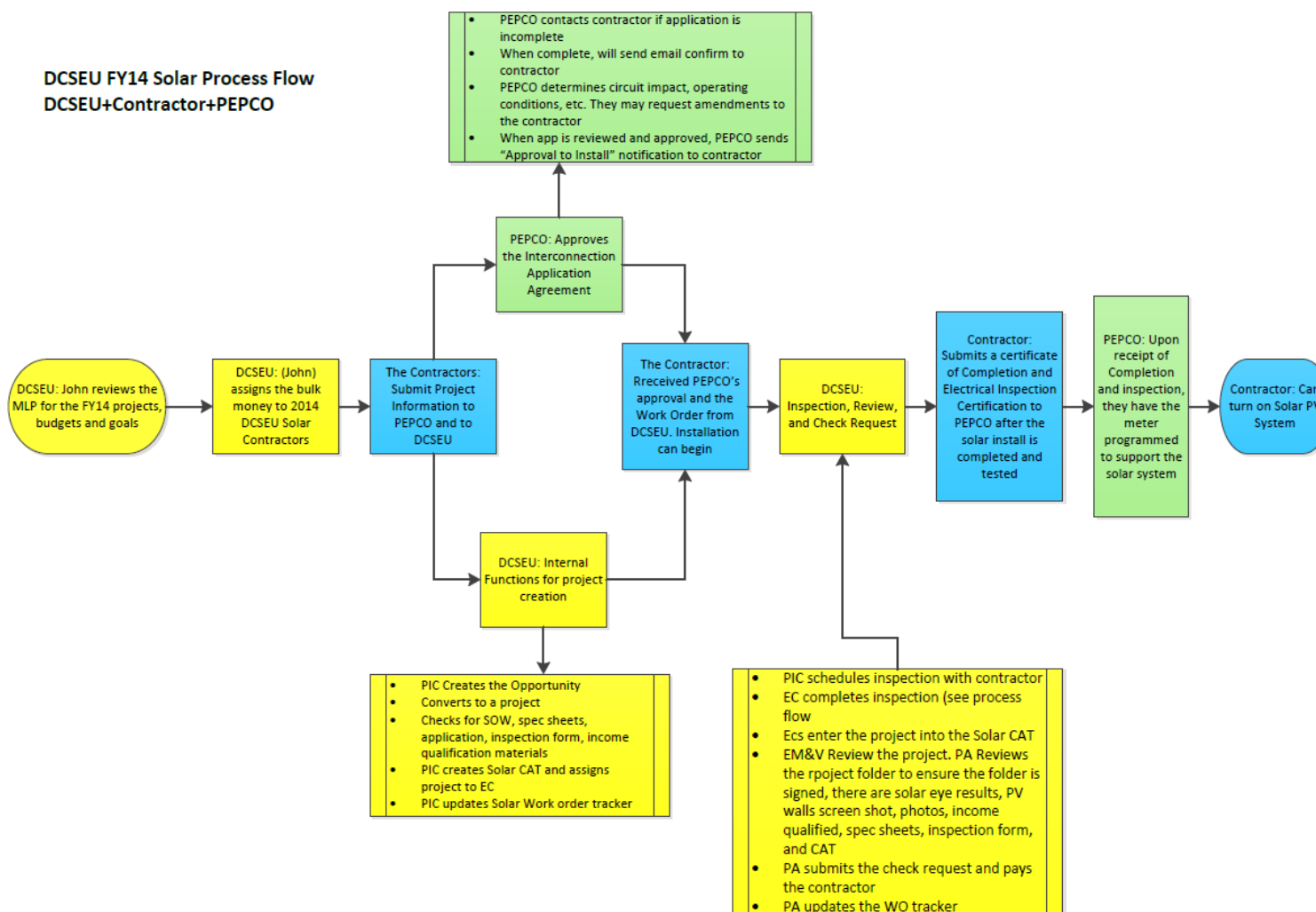
APPENDIX H: FOOD BANK LOGIC MODEL



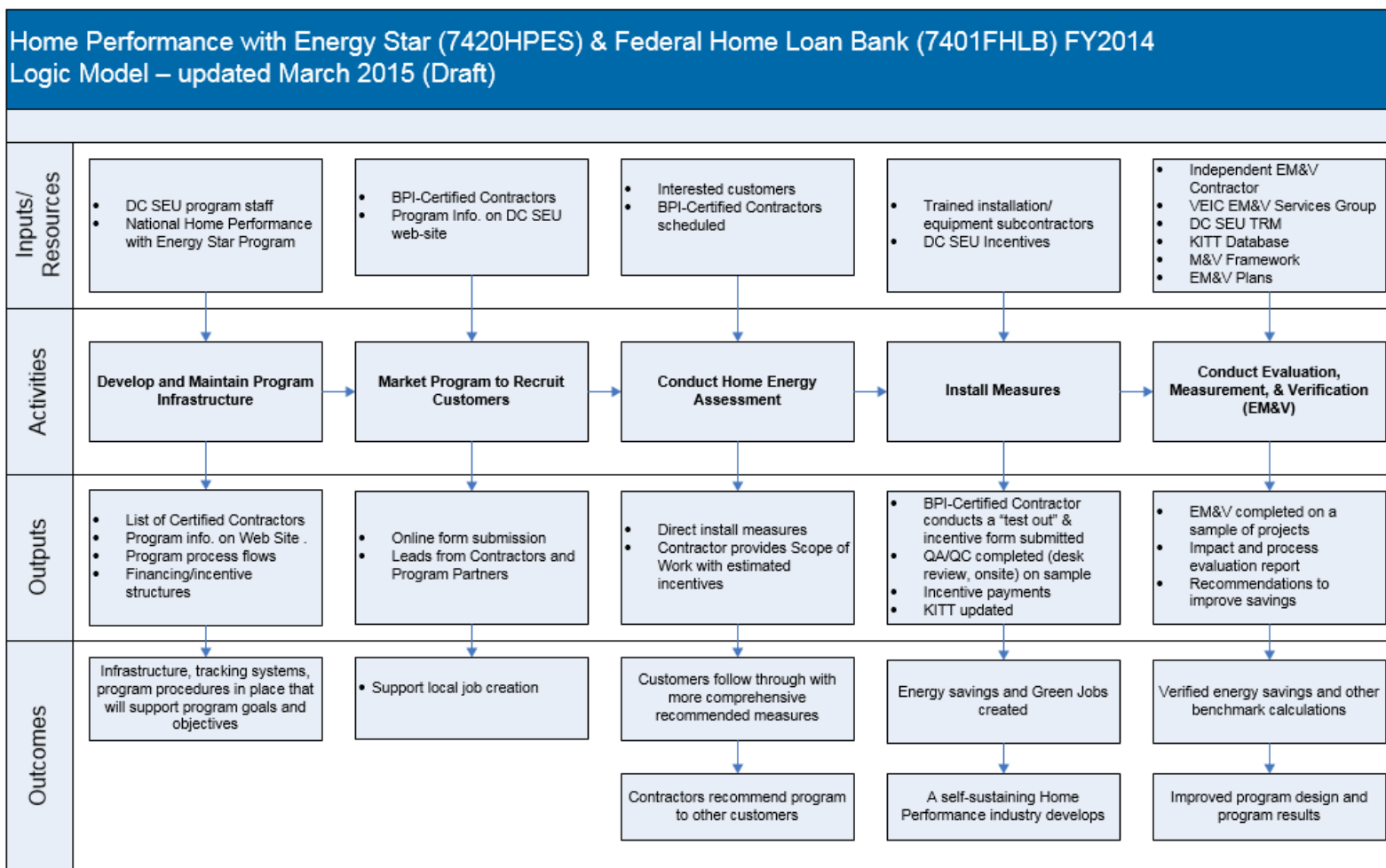
APPENDIX I: SOLAR HOT WATER & SOLAR PV LOGIC MODEL



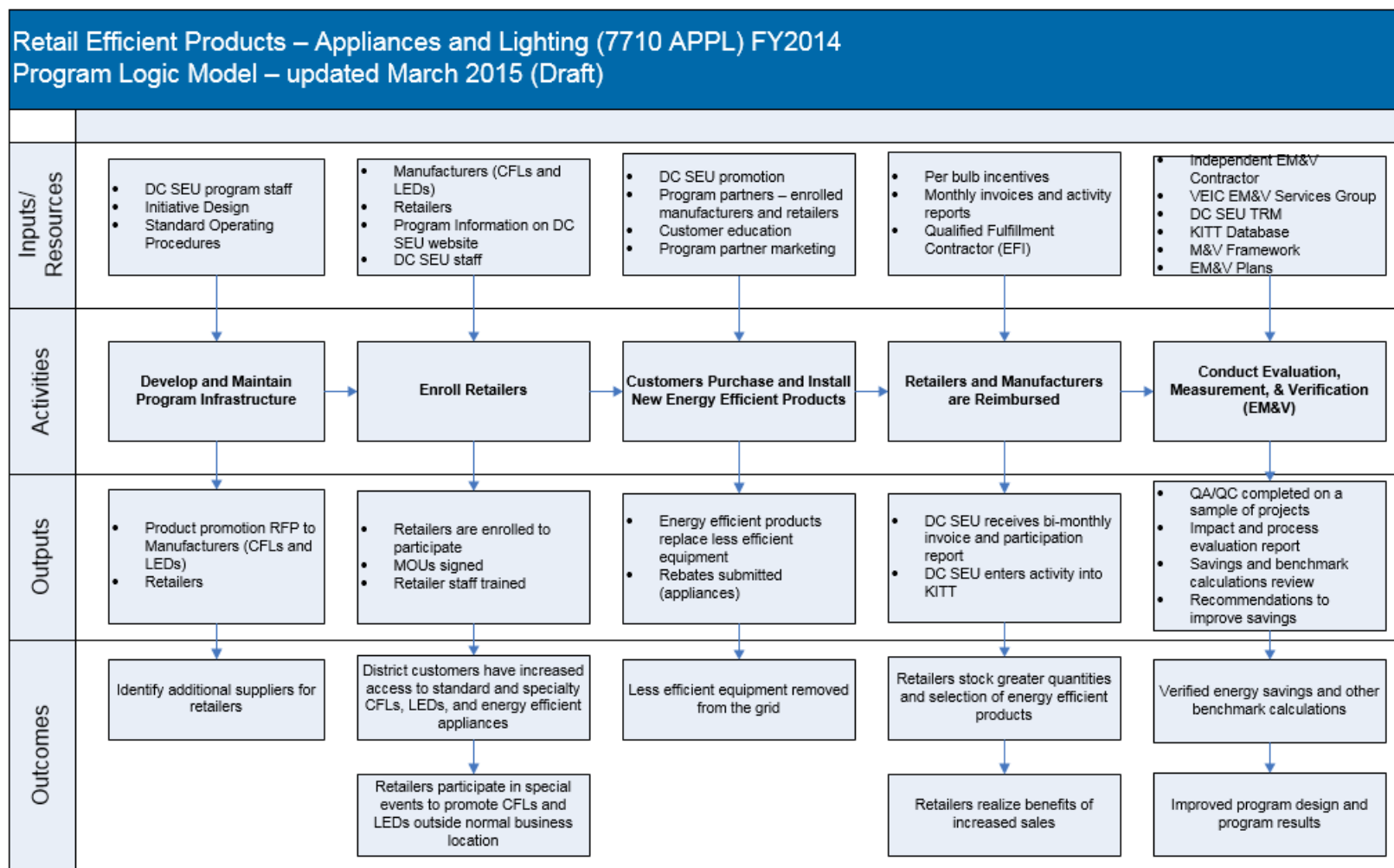
APPENDIX J: SOLAR PV PROCESS FLOW CHART



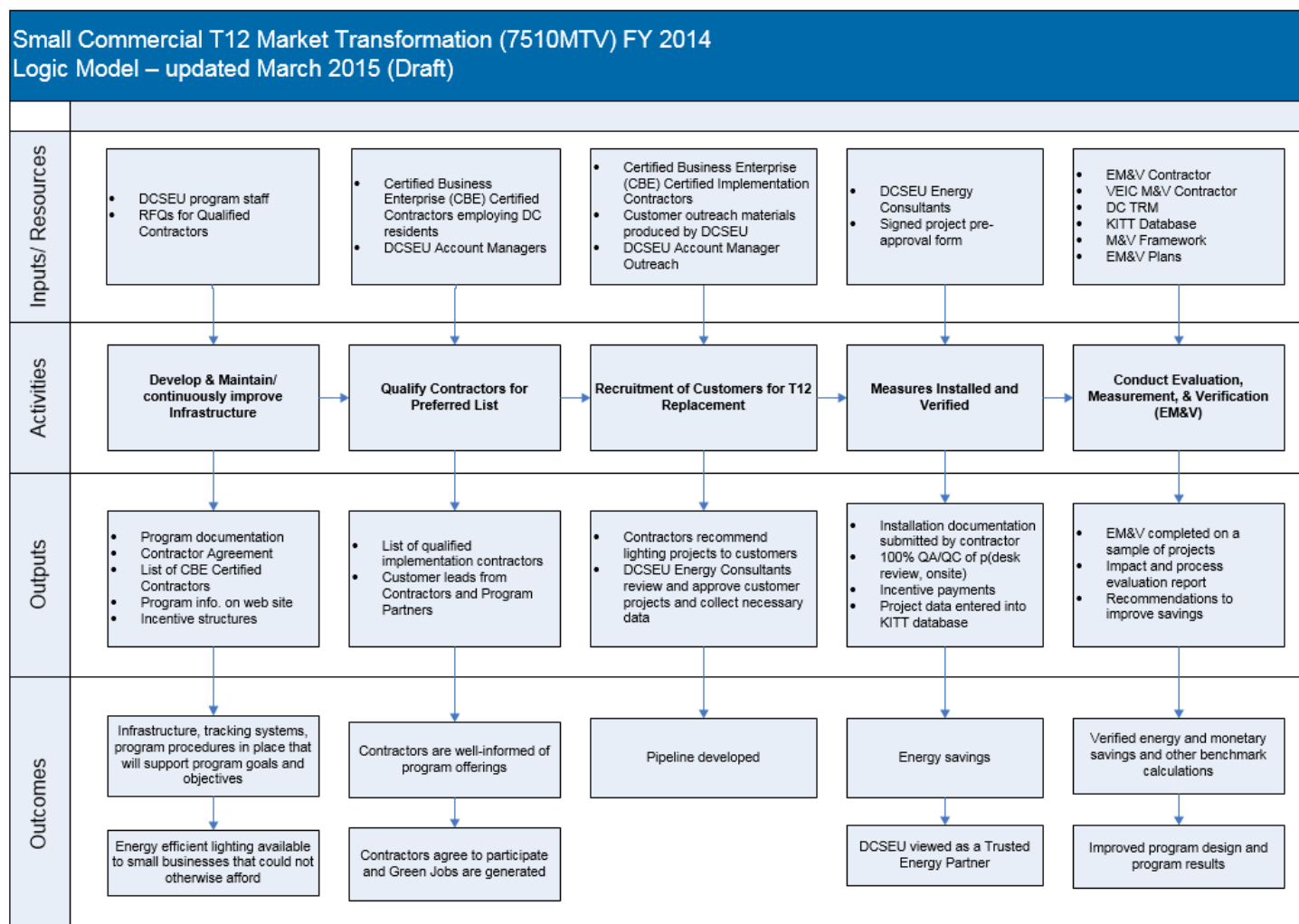
APPENDIX K: HPWES AND FEDERAL HOME LOAN BANK LOGIC MODELS



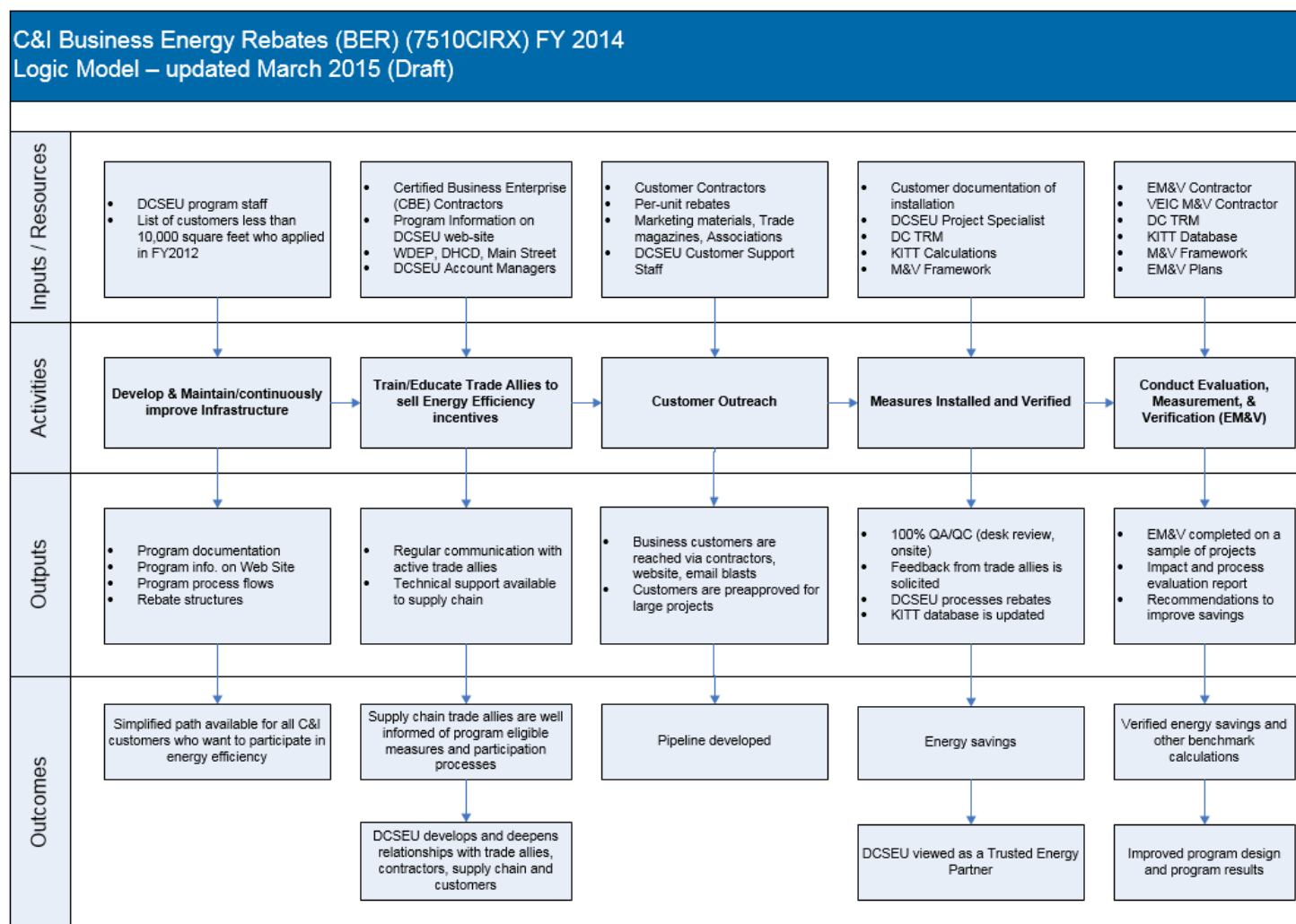
APPENDIX L: RETAIL EFFICIENT PRODUCTS LOGIC MODEL



APPENDIX M: T12 MARKET TRANSFORMATION LOGIC MODEL



APPENDIX N: BUSINESS ENERGY REBATES LOGIC MODEL



APPENDIX O: CUSTOM SERVICES FOR C&I CUSTOMERS

