CONNECTICUT
GREEN BANK SM

Audit, Compliance and Governance Committee

Meeting Date

October 10, 2018

CONNECTICUT
GREEN BANK

Audit, Compliance, & Governance Committee Members

Matthew Ranelli, Chairman

Partner, Shipman & Goodwin LLP

Thomas M. Flynn

Managing Member, Coral Drive Partners LLC

Gina McCarthy

Former Administrators of the Environmental Protection Agency

845 Brook Street, Rocky Hill, CT 06067
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CONNECTICUT
GREEN BANK

October 3, 2018

Dear Audit, Compliance and Governance (ACG) Committee Members,

We look forward to our meeting on Wednesday, October 10th at the Connecticut Green Bank in Rocky Hill from 8:30 a.m. to 9:30 a.m. We will be discussing the following agenda items:

1. Board Member Attendance review;
2. Auditors of Public Account Overview
3. Annual Governance Review;
4. Tax Methodology;
5. CAFR; and
6. Legislative Update.

As always, please let me know if you have any questions.

Sincerely,

Brian Farnen
General Counsel & Chief Legal Officer

AGENDA

Audit, Compliance and Governance Committee of the
Connecticut Green Bank
845 Brook Street
Rocky Hill, CT 06067

Wednesday, October 10, 2018
8:30 – 9:30 a.m.

Staff Invited: George Bellas, Brian Farnen, Bryan Garcia, Bert Hunter, Matt Macunas and Eric Shrago

Others invites:

1. Call to order
2. Public Comments – 5 minutes
3. Approve Meeting Minutes for June 8, 2018* – 5 minutes
4. Board Member Attendance Review - 5 minutes
5. Auditors of Public Accounts Overview – 5 minutes
6. Governance Review – 5 minutes
7. Tax Methodology – 10 minutes
8. Discuss Proposed Draft Comprehensive Annual Financial Report (CAFR)** - 40 minutes
9. 2019 Legislative and Regulatory Update – 5 minutes
10. Adjourn

*Denotes item requiring Committee action
** Denotes item requiring Committee action and recommendation to the Board for approval

Join the meeting online at **https://global.gotomeeting.com/join/643856493**

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Access Code: 643-856-493

Next Regular Meeting: TBA
Connecticut Green Bank, 845 Brook Street, Rocky Hill, CT

RESOLUTIONS

Audit, Compliance and Governance Committee of the
Connecticut Green Bank
845 Brook Street
Rocky Hill, CT 06067

Wednesday, October 10, 2018
8:30 – 9:30 a.m.

Staff Invited: George Bellas, Brian Farnen, Bryan Garcia, Bert Hunter, Matt Macunas and Eric Shrago

Others invites:

1. Call to order

2. Public Comments – 5 minutes

3. Approve Meeting Minutes for June 8, 2018* – 5 minutes

   Resolution #1

   Motion to approve the minutes of the Audit, Compliance and Governance Committee meeting for June 8, 2018. Second. Discussion. Vote.

4. Board Member Attendance Review - 5 minutes – Brian Farnen

5. Auditors of Public Accounts Overview – 5 minutes – George Bellas

6. Governance Review – 5 minutes – Brian Farnen

7. Tax Methodology – 10 minutes – Eric Shrago

   Resolution #2

   RESOLVED, that the Audit, Compliance and Governance Committee hereby recommends to the Board of Directors for approval on its consent agenda the proposed Tax Calculator for the Evaluation and Measurement of the tax revenue generated by Green Bank supported projects

8. Discuss proposed draft Comprehensive Annual Financial Report (CAFR)** - 40 minutes – George Bellas

   Resolution #3

RESOLVED, that the Audit, Compliance and Governance Committee hereby recommends to the Board of Directors for approval the proposed draft CAFR and Federal Single Audit Report for the fiscal year ending June 30, 2018.
Second. Discussion. Vote

9. 2019 Legislative and Regulatory Update – 5 minutes – Brian Farnen and Matt Macunas

10. Adjourn

*Denotes item requiring Committee action
** Denotes item requiring Committee action and recommendation to the Board for approval

Join the meeting online at **https://global.gotomeeting.com/join/643856493**

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Dial **+1 (646) 749-3122**
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Next Regular Meeting: TBA
Connecticut Green Bank, 845 Brook Street, Rocky Hill, CT

CONNECTICUT GREEN BANK SM

Audit, Compliance and Governance Committee

October 10, 2018

ACG Committee

Agenda Item #1

Call to Order

ACG Committee

Agenda Item #2

Public Comments

ACG Committee

Agenda Item #3

Consent Agenda

Consent Agenda
Resolution 1

1. **Meeting Minutes** – approval of meeting minutes of June 8, 2017

ACG Committee

Agenda Item #4

BOD Member Attendance Review

Bylaws – Section 4.6

Directors or their designees who miss more than three (3) consecutive meetings shall be asked to become more active on the Board.

In the event of further absence, the Board may decide by majority vote to recommend to the appointing authority that the appointment be reconsidered.

Connecticut Green Bank
BOD Member Attendance Review

Review of Board and Committee Member Attendance.

No members out of compliance at this time.

ACG Committee

Agenda Item #5

Auditors of Public Accounts

Overview

Connecticut Green Bank
APA Overview

Overview of Auditors of Public Accounts Findings.

- Draft Findings
- Proposed Comments

ACG Committee

Agenda Item #6

Governance Review

Connecticut Green Bank
Governance Review

Annual Review of Operating Procedures, Bylaws, and Enabling Statute.

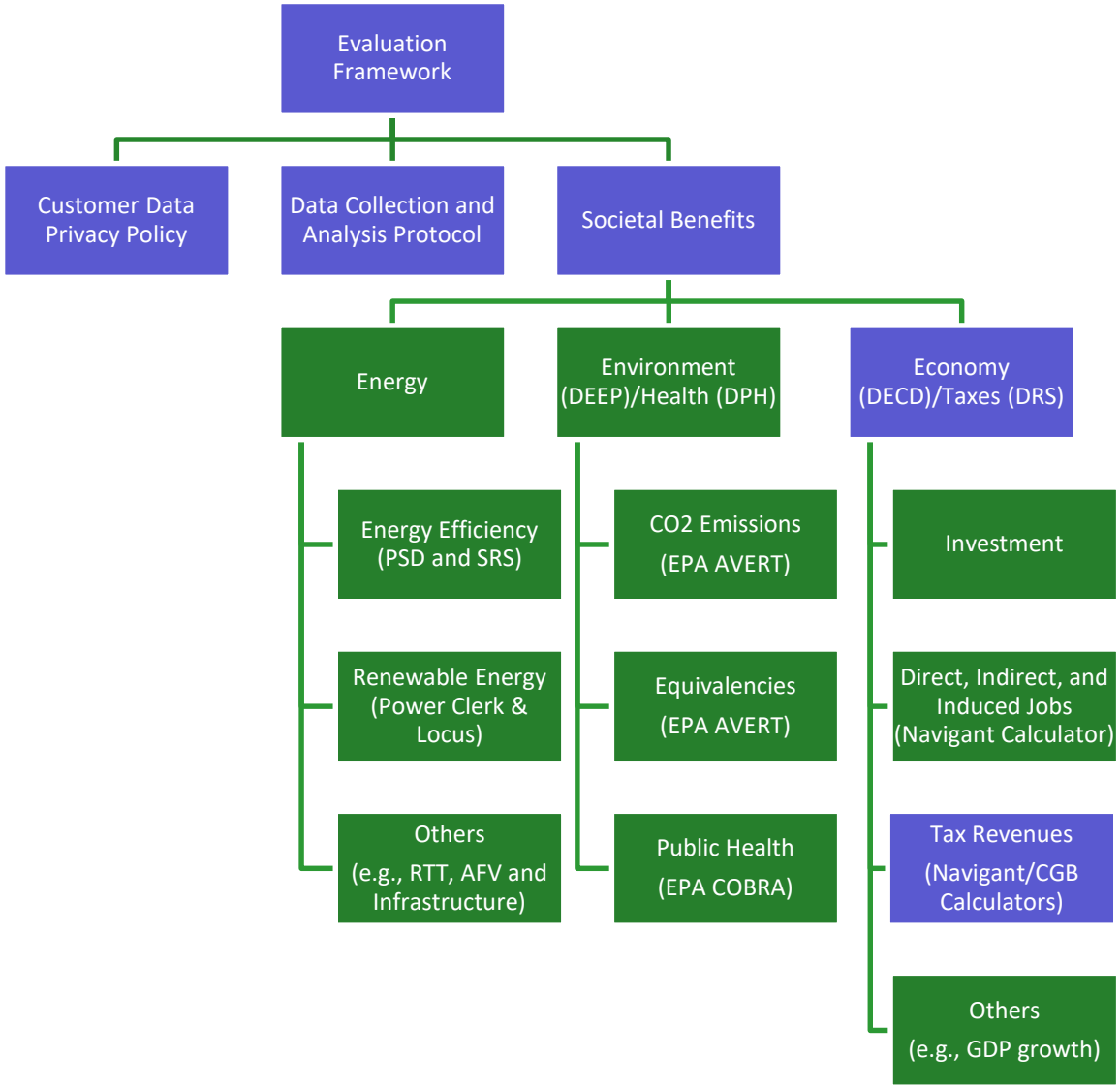
No staff suggested changes at this time.

ACG Committee

Agenda Item #7

Tax Methodology

Evaluation Framework



Economic Impact
Tax Revenues

- **Goal:** Illustrate to stakeholders the tax revenues generated by investments driven by the Green Bank make
- **Approach:**
  - **Income Tax:** Navigant led methodology leveraging the Jobs Calculator and the DRS Tax Calculator
  - **Corporate Tax :** Navigant led methodology estimating taxable income and applying CT tax rates
  - **Sales Tax:** Application of CT sales tax rate of 6.35% to purchases of equipment and services

Income Tax
Individual Income Tax

a. Direct Jobs

[Number of job-years created] x [weighted average wage] x [income tax rate]

2016 Jobs Calculator | *2016 Jobs Calculator* | *CT DRS Tax Calculator*

b. Indirect/Induced Jobs

[Number of job-years created] x [weighted average wage] x [income tax rate]

2016 Jobs Calculator | *NREL JEDI Model* | *CT DRS Tax Calculator*

Legend:
[Item]
Source

Income Tax
Corporate Income Tax

[Sum of taxable income] x [corporate tax rate]
From parties below *CT Tax Rates*

a. Determine all potential parties:

- **Installer/EPC** – taxable income from technology installation/sales
- **Sponsor Equity Investor** – taxable income from a portion of project distributions
- **For-Profit Bank** – taxable income from loan proceeds over useful life
- **Host** – taxable income from buying power for cheaper (NPV of change in profit)
- **Tax Equity Investor** – taxable income from a portion of project distributions + tax benefits

b. Apply CT corporate tax rate to the estimated taxable income by technology/deal type

c. The Net Present Value of the Corporate Income Tax payments estimated over the assumed usable life of the project at a 3% discount rate to estimate the value of this revenue today

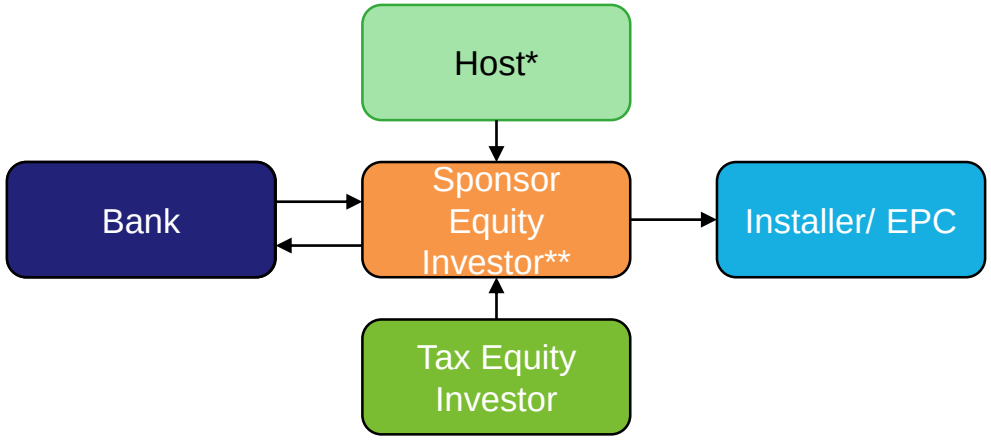
Legend:
[Item]
Source

Income Tax

Corporate Income Tax

a.) Lease/PPA

(e.g., solar, wind or hydro projects)

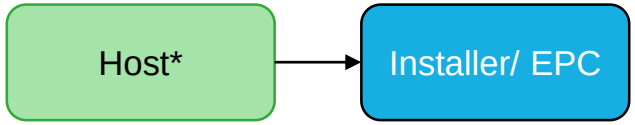


b.) Loan Program

(e.g., ductless split heat pump, CHP)

c.) Residential EE Programs

(e.g., lighting, HES Audits)

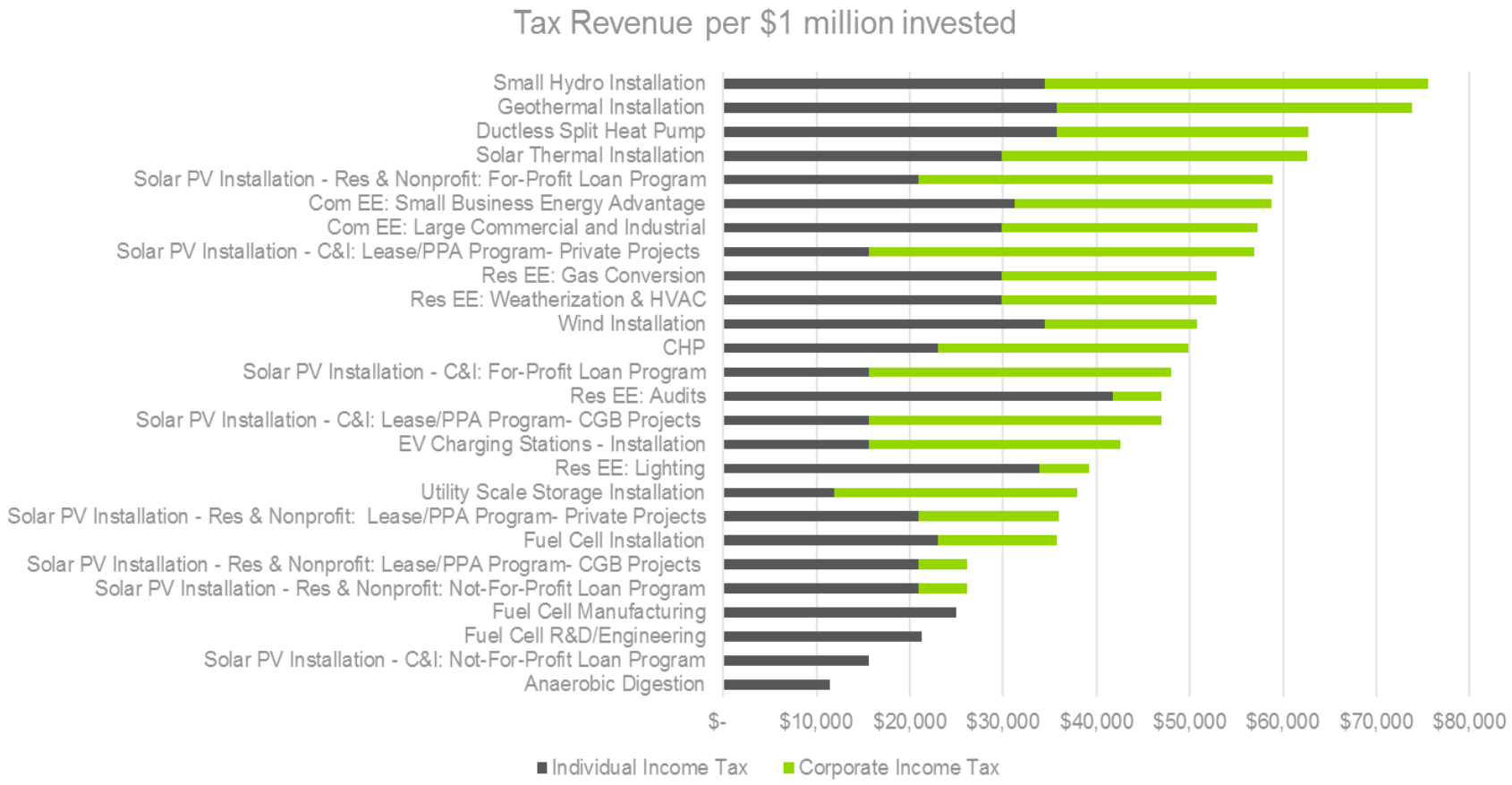


* Changes to host taxable income only in some scenarios

** Sponsor Equity Investor and Installer/EPC sometimes same entity (e.g., SolarCity)

Income Tax
Results

Across the different project types, the total tax varies significantly, from $12,000 to $75,000 per million dollars invested.



Sales Tax
Methodology

[Sum of project cost] x [Labor : Hardware Factor] x [6.35%]

From program/product applications below	*Navigant Tax Calculator*	*CT Tax Rates*

a. The Price of the project is considered the amount sold to the customer
b. To determine the portion of this cost that is subject to sales tax, the labor to hardware factor is applied
c. This amount is then multiplied by the state's sales tax rate of 6.35%

Note: Most Class 1 Renewables are presently exempt from the state Sales and/or Property Taxes

Legend:
[Item]
Source

Tax Revenues
Example

Residential Solar PV Project bought using a Smart-E Loan for a house in Rocky Hill for $27,500

Deployment

Jobs

Company

Personal Income Tax Revenue – $570

Corporate Income Tax Revenue – $1,040

Total Tax Revenue Generated: $1,610

REFERENCES

Installed cost data from the CT Green Bank "Market Watch Report" through December 31, 2017.

CT Green Bank is currently working with Navigant Consulting and Connecticut Department of Revenue Services to estimate personal and corporate income taxes from clean energy deployment. Estimate of $20,878 of personal income taxes (with loan) and $37,978 of corporate income taxes per $1 million of investment in residential solar PV.

Note that most Class 1 Renewables are presently exempt from the state Sales and/or Property Taxes

ACG Committee

Agenda Item #8

Comprehensive Annual Financial Report (CAFR)

Connecticut Green Bank
CAFR

See Blum Shapiro Presentation

ACG Committee

Agenda Item #9

2019 Legislative and Regulatory Update

2019 Legislative Session
Overview

- **Energy** - PA 18-50 (SB-9) – advances key goals and policies for EE and RE:
  - 40% Class I RPS by 2030
  - Successor programs for how RE is compensated

- **Climate** - PA 18-82 (SB-7) – GC3 climate change bill, with sea level and mid-term GHG guides

- **SCRF** – PA 18-42 – secures a Dec. 2017 deal with CCSU system outside normal deadlines for SCRF access

- **Quasi-Public Agency related** – PA 18-137 – quasi's can't pay > $50k severance for settlement/non-disparagement

- **Solar PV Property Tax Exemption** - SB-420 (unpassed) – fought back effort of small municipal group to remove exemption for residential TPO systems.

ACG Committee

Agenda Item #10

Adjourn

AUDIT, COMPLIANCE AND GOVERNANCE COMMITTEE OF THE CONNECTICUT GREEN BANK

Draft Minutes – Regular Meeting
Friday, June 8, 2018
8:30 – 9:30 a.m.

A regular meeting of the Audit, Compliance, and Governance Committee ("Audit Committee") of the Board of Directors of the Connecticut Green Bank (the "Green Bank") was held on June 8, 2018 at the office of the Connecticut Green Bank, 845 Brook Street, Rocky Hill, CT in the Albert Pope Board Room.

1. **Call to order:** Mr. Ranelli, Chairperson of the Audit Committee, called the meeting to order at 8:34 a.m. Audit Committee members participating: Matt Ranelli (by phone) and Tom Flynn (by phone) and Gina McCarthy (by phone).

   Staff Attending: George Bellas, Bryan Garcia (by phone), Brian Farnen (by phone), Bert Hunter (by phone), Eric Shrago and Cheryl Samuels.

2. **Public Comments:**

   There were no public comments.

3. **Approve Meeting Minutes for October 11, 2017:**

   Upon a motion made by Tom Flynn, and seconded by Matt Ranelli, with an abstention from Gina McCarthy, the Committee voted to approve the Minutes from the October 11, 2017 meeting.

   Resolution #1

   Motion to approve the minutes of the Audit, Compliance and Governance Committee meeting for October 11, 2017.
   Second. Discussion. Vote.

4. **Annual Review of Accounting Internal Control Policies:**

   George Bellas reviewed the Green Bank's Internal Accounting Controls over disbursements, contracts, cell phones and credit cards. He reviewed minor changes being proposed to the procedures. In response to questions from Mr. Ranelli pertaining to controls over credit card disbursements, Mr Bellas stated that the credit limit for the one card maintained by the Green Bank is $10,000 and that both he and Brian Farnen review the monthly credit card statement. Mr. Ranelli asked if cash advances could be transacted with the card and Mr. Bellas didn't think so but would check on this with the credit card company.

Upon a motion made by Eric Shrago, and seconded by Gina McCarthy, the Resolution passed.

Resolution #2

RESOLVED, that the Audit, Compliance and Governance Committee hereby recommends to the Board of Directors for approval the proposed revisions to the current internal accounting control policies.
Second. Discussion. Vote

5. Employee Handbook Revisions for Recommendation to BOD:

Eric Shrago discussed the cleanup of the Employee Handbook. He stated that they are updating a few items that reflect the current state of affairs of the Green Bank. He stated that they made changes to the vacation payout language. He stated that the maximum payout would remain the same, at 240 hours. He stated that they have allowed employees to accrue over that amount within a Fiscal year but will not allow more than the 240 hours as a payout. He stated that if there is an involuntary separation, the separation date will be updated to reflect their vacation accrual. He discussed Tuition Assistance stating that will be in line with State and other quasi-organizations. He stated that they would assist part-time employees on a prorated basis. He stated that they do not have many part-time employees. He stated that there were some minor tweaks to IT to reflect their current structure.

Tom Flynn questioned the vacation payout. Eric Shrago stated that the max that will be paid out will be 240 hours. Tom Flynn questioned if they can use the time over 240 hours that they have accrued. Eric Shrago stated that yes, they can take those vacation hours prior to a separation, but that they will not pay for any unused hours over 240. Tom Flynn questioned why the number was 240. Eric Shrago stated that it is in line with State employees. Tom Flynn questioned how many days an employee accrues throughout the year. Eric Shrago stated that it depends on their tenure in the organization. Matt Ranelli questioned how many hours they can carry forward. Eric Shrago stated that you cannot roll over 240 hours. You can accrue, but you cannot roll over. Gina McCarthy questioned the maximum aggregate carryover and if there was a change. George Bellas stated that it's just carryover. Matt Ranelli questioned the allowance of an exception. Eric Shrago stated that that had been in there in the past. He stated that Bryan can give an exception of up to 10 days. Maximum aggregate carryover will be 30 days, or 240 hours. Matt Ranelli questioned if the employee takes the vacation payout if it counts towards vesting. Eric Shrago stated that they will need to check on that. Gina McCarthy questioned if this is all in line with the State and other quasi organizations. Eric Shrago stated that they are in line with them. Matt Ranelli questioned if the Green Bank offered comp time. Eric Shrago stated that they do, but that they rarely use it. George Bellas stated that managers are excluded. He stated that they have given some staff comp time when they've worked shows over weekends.

Upon a motion made by Gina McCarthy, and seconded by Tom Flynn, the Resolution passed.

Resolution #3

RESOLVED, that the Audit, Compliance and Governance Committee hereby recommends that the Board of Directors of the Connecticut Green Bank approval of the revisions to the Connecticut Green Bank Employee Handbook presented to on June 1, 2018.

6. Proposed Loan Loss Decision Framework and Process:

Bryan Garcia discussed the proposed Loan Loss Decision Framework. He stated that it had been reviewed by the Deployment Committee. He stated that the Green Bank had built a strong Balance Sheet with $70 million in income and assets. He stated that the Green Bank has had very few delinquencies and defaults, but that they are proposing a process on how to deal with transactions that do go awry regarding restricting and/or writing off. He stated that delegation of the authority is through the Deployment Committee. He stated that the structure that the senior staff has come up with would give the staff the ability to approve under $100,000 and no more in aggregate than $500,000. He stated that the staff is recommending that they look at the principal outstanding. With regards to losses, he discussed the loan loss reserve determination process. Mr. Bellas stated that staff reviews the Green Bank's investment portfolio and determines if any impairment on future cash flows from these investments exist. He stated that after this review staff allocates a percentage of outstanding principal to a loan loss reserve. Matt Ranelli questioned if they do a specific or a general reserve. Mr. Bellas stated that they do a general reserve and do some specific reserves on certain loans. He stated that the Green Bank has had very few write-offs. He stated that both the financial statement auditors and state auditors review these reserve calculations.

Bryan Garcia stated that the proposed framework is that the staff approval will be no more than $100,000 and the Deployment Committee would be $100,000 up to $1 million and the full Board would be above $1 million. Tom Flynn questioned why they are putting the approval of write-offs through the Deployment Committee. Brian Farnen stated that the Bylaws empower the Deployment Committee with oversight of the management of assets and investments. Brian Farnen stated that the ACG has overall authority over policies and procedures in place by the Green Bank. He stated that they would like the procedures to go through both the Deployment and ACG Committees. Tom Flynn questioned how this will work for write-offs. Brian Farnen stated that once the policy is in place there will be a certain dollar amount done at staff level, another level will be brought to the Deployment Committee and then anything over that will go to the ACG. Tom Flynn stated that he was not comfortable with write-offs going to the Deployment Committee. He questioned what the next step after writing off was from a legal perspective in collecting the debt. Brian Farnen stated that from legal, the write off would not impact the Green Bank's ability to still pursue borrower for the amount of money owed. He stated that it would be on a case by case basis on what level of debt

collection would be implemented. He stated that they would pursue it vigorously. Bryan Garcia stated that it will be in the Quarterly Report to the Deployment Committee. He stated that they will report monthly on the Loss Reserve. He stated that they will look at trends and frequency of losses to understand if there are any long-term issues. Tom Flynn questioned whether write-offs belong with the Deployment Committee. Gina McCarthy stated that they want to make certain that the staff has properly looked at transactions before they are written off. Tom Flynn stated that he felt that this should not be left up to the Deployment Committee alone. Matt Ranelli stated that they should recommend to the Board that write-offs between $100,000 and $1 million go to the ACG Committee. Bryan Garcia stated that they will revise the memo accordingly.

Upon a motion made by Tom Flynn, and seconded by Gina McCarthy, the Resolution passed with modifications.

Resolution #4

WHEREAS, pursuant to Section 5.3.1 of the Connecticut Green Bank (Green Bank) Bylaws, the Audit, Compliance & Governance (ACG) Committee is charged with the review and approval of, and in its discretion recommendations to the Board regarding, all governance and administrative matters affecting the Green Bank, including but not limited to matters of corporate governance and corporate governance policies;

WHEREAS, on January 18, 2013, the Board of Directors authorized Green Bank staff to evaluate and approve funding requests less than $300,000 which are pursuant to an established formal approval process requiring the signature of a Green Bank officer, consistent with the Green Bank Comprehensive Plan, approved within Green Bank's fiscal budget and in an aggregate amount not to exceed $500,000 from the date of the last Deployment Committee meeting ("Staff Approval Policy for Projects Under $300,000");

WHEREAS, on July 18, 2014, the Green Bank Board of Directors approved of a recommendation brought forth by the Audit, Compliance, and Governance Committee and Deployment Committee to approve the authorization of Green Bank staff to evaluate and approve program funding requests less than $300,000 which are pursuant to an established formal approval process requiring the signature of a Green Bank officer, consistent with the Green Bank Comprehensive Plan, approved within Green Bank's fiscal budget and in an aggregate amount not to exceed $1,000,000 from the date of the last Deployment Committee meeting;

WHEREAS, on October 20, 2017, the Green Bank Board of Directors approved of a recommendation brought forth by the ACG Committee and Deployment Committee to approve the authorization to amend the Staff Approval Policy to increase program funding requests for Projects Under $300,000 to $500,000 with an aggregate amount limit of $1,000,000 from the date of the last Deployment Committee meeting; and

WHEREAS, the Staff of the Green Bank propose in a memorandum to the Deployment Committee on May 29, 2018, and revised based on feedback by the Deployment Committee for review and recommendation for approval by the ACG Committee a Loan Loss Decision Framework and Process for managing assets requiring restructuring or write-off from the Green Bank's balance sheet.

NOW, therefore be it:

RESOLVED, that the ACG Committee recommends that the Board approve of the Staff proposed Loan Loss Decision Framework and Process for managing assets requiring restructuring or write-off from the Green Bank's balance sheet and consistent with the memorandum dated June 8, 2018 which incorporates feedback from the Deployment Committee and with the one additional modification from the ACG Committee that transactions requiring a write-off would be through the ACG Committee after legal remedies have been pursued by staff on the impaired asset in question; and

RESOLVED, that the ACG Committee recommends that the Board of Directors authorizes Green Bank staff to evaluate and approve loan loss restructurings or write-offs for transactions less than $100,000 of the principal amount outstanding and no more in aggregate than $500,000 from the date of the last Deployment Committee meeting ("Staff Loan Loss Approval Policy for Transactions Under $100,000") and consistent with the memorandum dated June 8, 2018 which incorporates feedback from the Deployment Committee.

7. 2018 Legislative and Regulatory Update:

Brian Farnen provided an update on the Legislative Session. He stated that overall it was a successful session. He stated that they were aiming to protect the Green Bank's Balance Sheet. He stated that they were successful in doing that. He stated that they also want to protect the Green Bank from future raids. He stated that they bolstered language into the Green Bank's enabling statute that says that the State cannot impair the Green Bank's ability to contract with third parties. He stated that it's called a Non-Impairment Provision. He stated that they used the opportunity to educate legislative leaders on what the nonimpairment provision is and what it means. He stated that it is meant to encourage third parties to feel comfortable entering into agreements with government bodies. He stated that the passage of the SB9 Energy Bill made a lot of long-term changes, with strong commitments to Clean Energy Policy while reducing costs. He stated that the GC3 Bill also passed.

8. Adjourn:

Upon a motion made by Tom Flynn, and seconded by Gina McCarthy, the meeting was adjourned at 9:29 a.m.

Respectfully Submitted,

Matthew Ranelli, Chairperson of the Audit,
Compliance, and Governance Committee

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CONNECTICUT GREEN BANK

Memo

To: Audit, Compliance and Governance Committee

From: Eric Shrago, Director of Operations

Date: October 3, 2018

Re: Tax Revenue Contribution Estimate Measurement Methodology

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Describing the contributions of the projects supported by the Connecticut Green Bank to the economy helps illustrate the how the continued deployment of clean energy and thus the Green Bank helps society. Estimation of the tax revenue generated by the projects supported by the Green Bank is a new part of the Societal Impact section of the Evaluation Framework.

Earlier this year, the Green Bank engaged Navigant Consulting to conduct a study and develop a model for estimating the taxes generated by Green Bank supported projects. The study was built off of the 2016 refreshed Jobs Study commissioned by the Green Bank and the Connecticut Department of Economic and Community Development. The model estimates personal and corporate income taxes as well as sales and use taxes based on the jobs created and financial structures of projects. The study and the resulting tax calculator have been reviewed by the CT Department of Revenue Services (DRS), who have found this to be an acceptable and reasonable tool for estimating this tax revenue.

Resolution

RESOLVED, that the Audit, Compliance and Governance Committee hereby recommends to the Board of Directors for approval on its consent agenda the proposed Tax Calculator for the Evaluation and Measurement of the tax revenue generated by Green Bank supported projects

TAX REVENUE CALCULATOR

FINAL REPORT

MARCH 28, 2018

199719

CONNECTICUT GREEN BANK SM

NAVIGANT

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NAVIGANT

OUTLINE

I. Background
II. Assumptions
III. Drivers of tax revenue
IV. Methodology
V. Results
VI. Sources
VII. Technology dashboards

BACKGROUND:
GOAL OF PROJECT

The Connecticut Green Bank asked Navigant to assist with measuring economic impacts other than job creation, starting with tax revenue generation.

Create a tax revenue calculator to determine the taxes generated for the State of Connecticut as a result of co-investment by CGB in RE and EE projects. Specifically:

- Estimate the individual income tax, corporate income tax, and sales tax
- Calculate taxes generated per $1 million invested
- Provide taxes generated per $1 million invested for each technology agreed upon

Our understanding is the results of the tax revenue calculator can further help CGB as it relates to presentation of quantified benefits to the state legislature and others.

BACKGROUND: TECHNOLOGIES INCLUDED

All of the RE and EE technologies that were part of the Jobs Calculator were included in the Tax Revenue Calculator with the addition of Anaerobic Digestion and CHP.

Renewable Energy	
Fuel Cell	R&D/Engineering[1]
	Installation and Manufacturing[2]
Solar PV	Residential Installation
	Non Residential Installation
Renewable Thermal Technologies	Ductless Split Heat Pump
	Geothermal Installation
	Solar Thermal Installation
Other	Wind Installation
	Hydro Installation
	EV Charging Stations Installation
	Storage Installation
	Anaerobic Digestion[1,2]
	CHP[2]

Energy Efficiency	
Residential (Single and Multi-Family)	Lighting
	Home Energy Solutions (HES) – Audits
	HES – Weatherization & HVAC
	Gas Conversion
Commercial	Small Business Energy Advantage
	Large Commercial and Industrial

Notes:
1. Assumed not yet profitable
2. New technology versus jobs calculator

NAVIGANT

ASSUMPTIONS:
INDIVIDUAL AND CORPORATE INCOME TAXES

Various assumptions were necessary to estimate the return from taxable income in the state.

- Individual Income Tax
  - All jobs are located in Connecticut and everyone is paying taxes as single filers
  - Jobs receiving individual income tax are only for installations
    - Operation jobs were not part of this analysis.
- Corporate Income Tax
  - Corporate taxable income NPV was calculated which relies on project lifetime
    - Navigant assumptions on technology/project lifetimes based on industry knowledge
    - Conducted research to estimate current technology/project costs
  - Sponsor equity investor, tax equity investors, and banks for projects located in Connecticut pay Connecticut taxes
  - Sponsor equity investor typically only cover about 10% of project capital cost, with the rest of the investment coming from tax equity investors and banks
  - Fuel cell R&D and anaerobic digestion assumed not to be profitable based on industry insight so there are no corporate income taxes from these two technologies
  - Fuel cell manufacturing and installation assumed not to be profitable for the installer, but still profitable for the sponsor equity investor

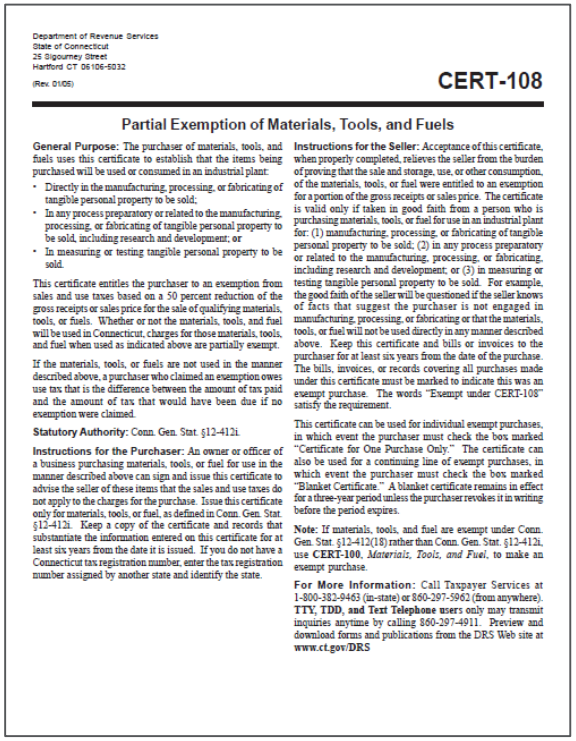
ASSUMPTIONS:
SALES AND USE TAXES

- All of the non-labor items are purchased from companies in CT or if purchased in another state, the customer pays use tax to CT
- Engineering and design labor will be split from other labor charges on the invoice since that labor is not subject to sales tax
- Exemption Certificates 108 and 109 provide a partial exemption (50%) to the non-labor portion of the fuel cell R&D/Engineering projects
- Exemption Certificate 140 applies to the following technology categories and provides for exemption of both non-labor and labor sales tax:
  - Solar PV Installations-residential, nonprofits, and C&I
  - Geothermal Installations
  - Solar Thermal Installations
- Multi-family projects are categorized with C&I projects and are not split based on the fraction of rentals that are owner-occupied compared to tenant-occupied units

ASSUMPTIONS:
SALES AND USE TAXES – EXEMPTION CERTIFICATES

We assume the applicant completes the required exemption certificates.

Exemption Certificate 108



Department of Revenue Services
State of Connecticut
25 Sigourney Street
Hartford CT 06106-5032

(Rev. 01/05)

CERT-108

Partial Exemption of Materials, Tools, and Fuels

General Purpose: The purchaser of materials, tools, and fuels uses this certificate to establish that the items being purchased will be used or consumed in an industrial plant:

- Directly in the manufacturing, processing, or fabricating of tangible personal property to be sold;
- In any process preparatory or related to the manufacturing, processing, or fabricating of tangible personal property to be sold, including research and development; or
- In measuring or testing tangible personal property to be sold.

This certificate entitles the purchaser to an exemption from sales and use taxes based on a 50 percent reduction of the gross receipts or sales price for the sale of qualifying materials, tools, or fuels. Whether or not the materials, tools, and fuel will be used in Connecticut, charges for those materials, tools, and fuel when used as indicated above are partially exempt.

If the materials, tools, or fuels are not used in the manner described above, a purchaser who claimed an exemption owes use tax that is the difference between the amount of tax paid and the amount of tax that would have been due if no exemption were claimed.

Statutory Authority: Conn. Gen. Stat. §12-412i.

Instructions for the Purchaser: An owner or officer of a business purchasing materials, tools, or fuel for use in the manner described above can sign and issue this certificate to advise the seller of these items that the sales and use taxes do not apply to the charges for the purchase. Issue this certificate only for materials, tools, or fuel, as defined in Conn. Gen. Stat. §12-412i. Keep a copy of the certificate and records that substantiate the information entered on this certificate for at least six years from the date it is issued. If you do not have a Connecticut tax registration number, enter the tax registration number assigned by another state and identify the state.

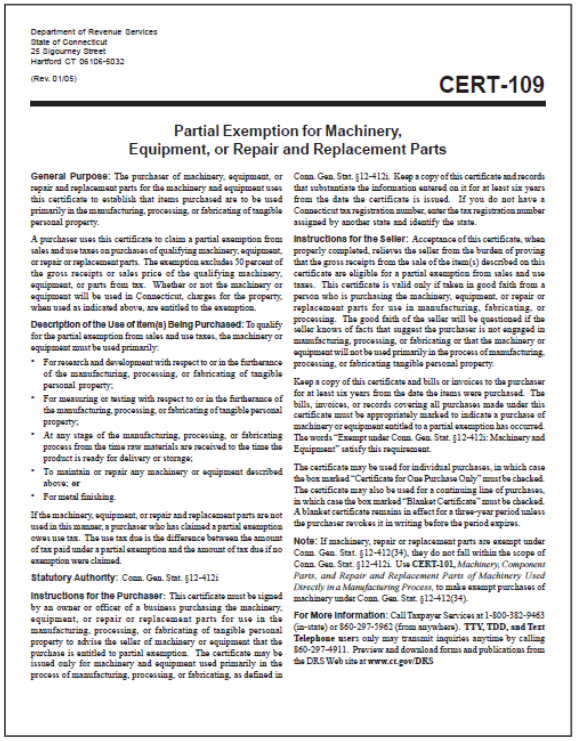
Instructions for the Seller: Acceptance of this certificate, when properly completed, relieves the seller from the burden of proving that the sale and storage, use, or other consumption, of the materials, tools, or fuel were entitled to an exemption for a portion of the gross receipts or sales price. The certificate is valid only if taken in good faith from a person who is purchasing materials, tools, or fuel for use in an industrial plant for: (1) manufacturing, processing, or fabricating of tangible personal property to be sold; (2) in any process preparatory or related to the manufacturing, processing, or fabricating, including research and development; or (3) in measuring or testing tangible personal property to be sold. For example, the good faith of the seller will be questioned if the seller knows of facts that suggest the purchaser is not engaged in manufacturing, processing, or fabricating or that the materials, tools, or fuel will not be used directly in any manner described above. Keep this certificate and bills or invoices to the purchaser for at least six years from the date of the purchase. The bills, invoices, or records covering all purchases made under this certificate must be marked to indicate this was an exempt purchase. The words "Exempt under CERT-108" satisfy the requirement.

This certificate can be used for individual exempt purchases, in which event the purchaser must check the box marked "Certificate for One Purchase Only." The certificate can also be used for a continuing line of exempt purchases, in which event the purchaser must check the box marked "Blanket Certificate." A blanket certificate remains in effect for a three-year period unless the purchaser revokes it in writing before the period expires.

Note: If materials, tools, and fuel are exempt under Conn. Gen. Stat. §12-412(18) rather than Conn. Gen. Stat. §12-412i, use **CERT-100**, *Materials, Tools, and Fuel*, to make an exempt purchase.

For More Information: Call Taxpayer Services at 1-800-382-9463 (in-state) or 860-297-5962 (from anywhere). **TTY, TDD, and Text Telephone users** only may transmit inquiries anytime by calling 860-297-4911. Preview and download forms and publications from the DRS Web site at **www.ct.gov/DRS**

Exemption Certificate 109



Department of Revenue Services
State of Connecticut
25 Sigourney Street
Hartford CT 06106-5032

(Rev. 01/05)

CERT-109

Partial Exemption for Machinery, Equipment, or Repair and Replacement Parts

General Purpose: The purchaser of machinery, equipment, or repair and replacement parts for the machinery and equipment uses this certificate to establish that items purchased are to be used primarily in the manufacturing, processing, or fabricating of tangible personal property.

A purchaser uses this certificate to claim a partial exemption from sales and use taxes on purchases of qualifying machinery, equipment, or repair or replacement parts. The exemption excludes 50 percent of the gross receipts or sales price of the qualifying machinery, equipment, or parts from tax. Whether or not the machinery or equipment will be used in Connecticut, charges for the property, when used as indicated above, are entitled to the exemption.

Description of the Use of Item(s) Being Purchased: To qualify for the partial exemption from sales and use taxes, the machinery or equipment must be used primarily:

- For research and development with respect to or in the furtherance of the manufacturing, processing, or fabricating of tangible personal property;
- For measuring or testing with respect to or in the furtherance of the manufacturing, processing, or fabricating of tangible personal property;
- At any stage of the manufacturing, processing, or fabricating process from the time raw materials are received to the time the product is ready for delivery or storage;
- To maintain or repair any machinery or equipment described above; or
- For metal finishing.

If the machinery, equipment, or repair and replacement parts are not used in this manner, a purchaser who has claimed a partial exemption owes use tax. The use tax due is the difference between the amount of tax paid under a partial exemption and the amount of tax due if no exemption were claimed.

Statutory Authority: Conn. Gen. Stat. §12-412i

Instructions for the Purchaser: This certificate must be signed by an owner or officer of a business purchasing the machinery, equipment, or repair or replacement parts for use in the manufacturing, processing, or fabricating of tangible personal property to advise the seller of machinery or equipment that the purchase is entitled to partial exemption. The certificate may be issued only for machinery and equipment used primarily in the process of manufacturing, processing, or fabricating, as defined in Conn. Gen. Stat. §12-412i. Keep a copy of this certificate and records that substantiate the information entered on it for at least six years from the date the certificate is issued. If you do not have a Connecticut tax registration number, enter the tax registration number assigned by another state and identify the state.

Instructions for the Seller: Acceptance of this certificate, when properly completed, relieves the seller from the burden of proving that the gross receipts from the sale of the item(s) described on this certificate are eligible for a partial exemption from sales and use taxes. This certificate is valid only if taken in good faith from a person who is purchasing the machinery, equipment, or repair or replacement parts for use in manufacturing, fabricating, or processing. The good faith of the seller will be questioned if the seller knows of facts that suggest the purchaser is not engaged in manufacturing, processing, or fabricating or that the machinery or equipment will not be used primarily in the process of manufacturing, processing, or fabricating tangible personal property.

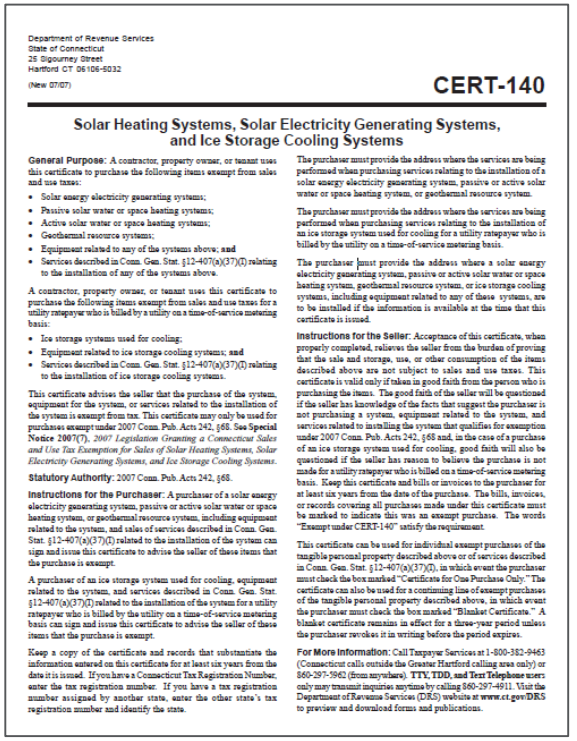
Keep a copy of this certificate and bills or invoices to the purchaser for at least six years from the date the items were purchased. The bills, invoices, or records covering all purchases made under this certificate must be appropriately marked to indicate a purchase of machinery or equipment entitled to a partial exemption has occurred. The words "Exempt under Conn. Gen. Stat. §12-412i: Machinery and Equipment" satisfy this requirement.

The certificate may be used for individual purchases, in which case the box marked "Certificate for One Purchase Only" must be checked. The certificate may also be used for a continuing line of purchases, in which case the box marked "Blanket Certificate" must be checked. A blanket certificate remains in effect for a three-year period unless the purchaser revokes it in writing before the period expires.

Note: If machinery, repair or replacement parts are exempt under Conn. Gen. Stat. §12-412(34), they do not fall within the scope of Conn. Gen. Stat. §12-412i. Use **CERT-101**, *Machinery, Component Parts, and Repair and Replacement Parts of Machinery Used Directly in a Manufacturing Process*, to make exempt purchases of machinery under Conn. Gen. Stat. §12-412(34).

For More Information: Call Taxpayer Services at 1-800-382-9463 (in-state) or 860-297-5962 (from anywhere). **TTY, TDD, and Text Telephone users** only may transmit inquiries anytime by calling 860-297-4911. Preview and download forms and publications from the DRS Web site at **www.ct.gov/DRS**

Exemption Certificate 140



Department of Revenue Services
State of Connecticut
25 Sigourney Street
Hartford CT 06106-5032

(New 07/07)

CERT-140

Solar Heating Systems, Solar Electricity Generating Systems, and Ice Storage Cooling Systems

General Purpose: A contractor, property owner, or tenant uses this certificate to purchase the following items exempt from sales and use taxes:

- Solar energy electricity generating systems;
- Passive solar water or space heating systems;
- Active solar water or space heating systems;
- Geothermal resource systems;
- Equipment related to any of the systems above; and
- Services described in Conn. Gen. Stat. §12-407(a)(37)(I) relating to the installation of any of the systems above.

A contractor, property owner, or tenant uses this certificate to purchase the following items exempt from sales and use taxes for a utility ratepayer who is billed by a utility on a time-of-service metering basis:

- Ice storage systems used for cooling;
- Equipment related to ice storage cooling systems; and
- Services described in Conn. Gen. Stat. §12-407(a)(37)(I) relating to the installation of ice storage cooling systems.

This certificate advises the seller that the purchase of the system, equipment for the system, or services related to the installation of the system is exempt from tax. This certificate may only be used for purchases exempt under 2007 Conn. Pub. Acts 242, §68. See **Special Notice 2007(7)**, *2007 Legislation Granting a Connecticut Sales and Use Tax Exemption for Sales of Solar Heating Systems, Solar Electricity Generating Systems, and Ice Storage Cooling Systems.*

Statutory Authority: 2007 Conn. Pub. Acts 242, §68.

Instructions for the Purchaser: A purchaser of a solar energy electricity generating system, passive or active solar water or space heating system, or geothermal resource system, including equipment related to the system, and sales of services described in Conn. Gen. Stat. §12-407(a)(37)(I) related to the installation of the system can sign and issue this certificate to advise the seller of these items that the purchase is exempt.

A purchaser of an ice storage system used for cooling, equipment related to the system, and services described in Conn. Gen. Stat. §12-407(a)(37)(I) related to the installation of the system for a utility ratepayer who is billed by the utility on a time-of-service metering basis can sign and issue this certificate to advise the seller of these items that the purchase is exempt.

Keep a copy of the certificate and records that substantiate the information entered on this certificate for at least six years from the date it is issued. If you have a Connecticut Tax Registration Number, enter the tax registration number. If you have a tax registration number assigned by another state, enter the other state's tax registration number and identify the state.

The purchaser must provide the address where the services are being performed when purchasing services relating to the installation of a solar energy electricity generating system, passive or active solar water or space heating system, or geothermal resource system.

The purchaser must provide the address where the services are being performed when purchasing services relating to the installation of an ice storage system used for cooling for a utility ratepayer who is billed by the utility on a time-of-service metering basis.

The purchaser must provide the address where a solar energy electricity generating system, passive or active solar water or space heating system, geothermal resource system, or ice storage cooling systems, including equipment related to any of these systems, are to be installed if the information is available at the time that this certificate is issued.

Instructions for the Seller: Acceptance of this certificate, when properly completed, relieves the seller from the burden of proving that the sale and storage, use, or other consumption of the items described above are not subject to sales and use taxes. This certificate is valid only if taken in good faith from the person who is purchasing the items. The good faith of the seller will be questioned if the seller has knowledge of the facts that suggest the purchaser is not purchasing a system, equipment related to the system, and services related to installing the system that qualifies for exemption under 2007 Conn. Pub. Acts 242, §68 and, in the case of a purchase of an ice storage system used for cooling, good faith will also be questioned if the seller has reason to believe the purchase is not made for a utility ratepayer who is billed on a time-of-service metering basis. Keep this certificate and bills or invoices to the purchaser for at least six years from the date of the purchase. The bills, invoices, or records covering all purchases made under this certificate must be marked to indicate this was an exempt purchase. The words "Exempt under CERT-140" satisfy the requirement.

This certificate can be used for individual exempt purchases of the tangible personal property described above or of services described in Conn. Gen. Stat. §12-407(a)(37)(I), in which event the purchaser must check the box marked "Certificate for One Purchase Only." The certificate can also be used for a continuing line of exempt purchases of the tangible personal property described above, in which event the purchaser must check the box marked "Blanket Certificate." A blanket certificate remains in effect for a three-year period unless the purchaser revokes it in writing before the period expires.

For More Information: Call Taxpayer Services at 1-800-382-9463 (Connecticut calls outside the Greater Hartford calling area only) or 860-297-5962 (from anywhere). **TTY, TDD, and Text Telephone users** only may transmit inquiries anytime by calling 860-297-4911. Visit the Department of Revenue Services (DRS) website at **www.ct.gov/DRS** to preview and download forms and publications.

NAVIGANT

ASSUMPTIONS:
ECONOMIC NEXUS WITH CT

- Navigant assumed that for all companies involved, they would pay CT income tax for their portion of the project income
- This is based on the how CT defines economic nexus:

  "Effective for tax years beginning on or after January 1, 2010, any companies, partnerships, and S corporations that derive income from Connecticut or have a substantial economic presence within Connecticut, in either case attributable to the purposeful direction of business activities toward Connecticut, will be subject to tax in Connecticut"

  http://www.ct.gov/drs/cwp/view.asp?A=1510&Q=470710
- **Economic nexus by commercial entity:**
  - Host: Employees and business located in CT
  - Installer/EPC: Employees in CT or derives income from CT
  - For-profit or not-for-profit bank: either located in CT or derives income from CT
  - Tax-equity investor: derives income from CT
  - Sponsor-equity investor: derives income from CT

METHODOLOGY:
INDIVIDUAL INCOME TAX

Starting with jobs calculator:

1. Individual Income Tax

a. Direct Jobs

[Number of job-years created] x [weighted average wage] x [income tax rate]

2016 Jobs Calculator *2016 Jobs Calculator* *CT DRS Tax Calculator*

b. Indirect/Induced Jobs

[Number of job-years created] x [weighted average wage] x [income tax rate]

2016 Jobs Calculator *NREL JEDI Model* *CT DRS Tax Calculator*

Legend:
[Item]
Source

METHODOLOGY:
CORPORATE INCOME TAX

2. Corporate Income Tax

[Sum of taxable income] x [corporate tax rate]
From parties below *CT Tax Rates*

a. Determine all potential parties:

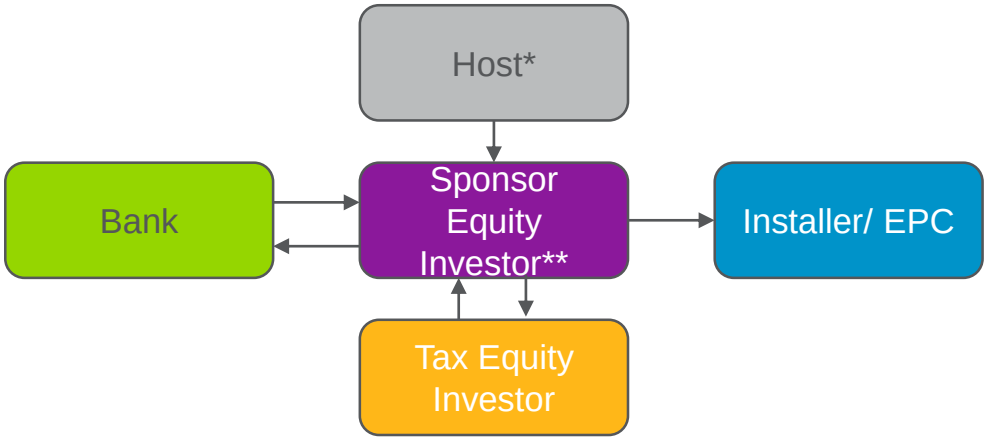
- **Installer/EPC** – taxable income from technology installation/sales
- **Sponsor Equity Investor** – taxable income from a portion of project distributions
- **For-Profit Bank** – taxable income from loan proceeds over useful life
- **Host** – taxable income from buying power for cheaper (NPV of change in profit)
- **Tax Equity Investor** – taxable income from a portion of project distributions + tax benefits

Legend:
[Item]
Source

METHODOLOGY:
CORPORATE INCOME TAX

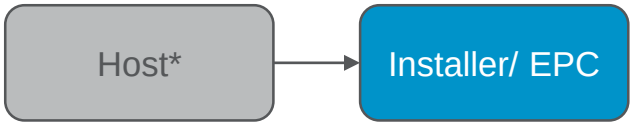
Multiple schemes possible based on project type/technology. Top three:

a.) Lease/PPA
(e.g., solar, wind or hydro projects)



b.) Loan Program
(e.g., ductless split heat pump, CHP)

c.) Residential EE Programs
(e.g., lighting, HES Audits)



* Changes to host taxable income only in some scenarios
** Sponsor Equity Investor and Installer/EPC sometimes same entity (e.g., SolarCity)

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HISTORY OF CORPORATE INCOME TAX EXEMPTIONS FOR ALTERNATIVE ENERGY COMPANIES IN CT

- In 1984 the following ruling was passed: Conn. Agencies Regs. Sec. 12-214-2. Companies exempt from tax.
  - “(8) "Individually owned company which had gross annual revenues not in excess of one hundred million dollars in the most recently completed year; which engaged in the research, design, manufacture, sale or installation of alternative energy systems;...”
- Based on research by the CT GB and Navigant, this exemption was repealed in 1999 and the current exemptions do not include alternative energy companies:
  - Insurance companies
  - Companies exempt by the federal corporation net income tax law
  - Domestic International Sales Corporations electing to be treated as a DISC under the I.R.C.
  - Companies subject to gross earnings taxes under Chapter 210
  - Cooperative housing corporations as defined for federal tax purposes
  - Corporate limited partners in one or more investment partnerships that are not otherwise doing business in Connecticut
  - Non-U.S. corporations whose sole activity in Connecticut is trading in stocks, securities or commodities for their own account. Certain political organizations exempt under I.R.C. §527 filing federal Form 1120-POL
  - Homeowners Associations filing federal Form 1120-H
  - Financial service companies whose corporate headquarters are located in the export zone in the City of Hartford and conduct all of their business outside the United States
  - Passive investment companies (PICs), defined under Conn. Gen. Stat. §12-213(a)(27) must file Form CT-1120 PIC in place of Form CT-1120.

3. Sales and Use Tax

Sales and use tax rate is 6.35%.

Labor

[Total direct labor cost-direct engineering/design labor cost] x [Sales tax rate]

2016 Jobs Calculator — *CT Tax Rates*

- 100% of labor is exempt for solar PV, solar thermal, and geothermal
- All residential labor is exempt for residential project types

Non-labor

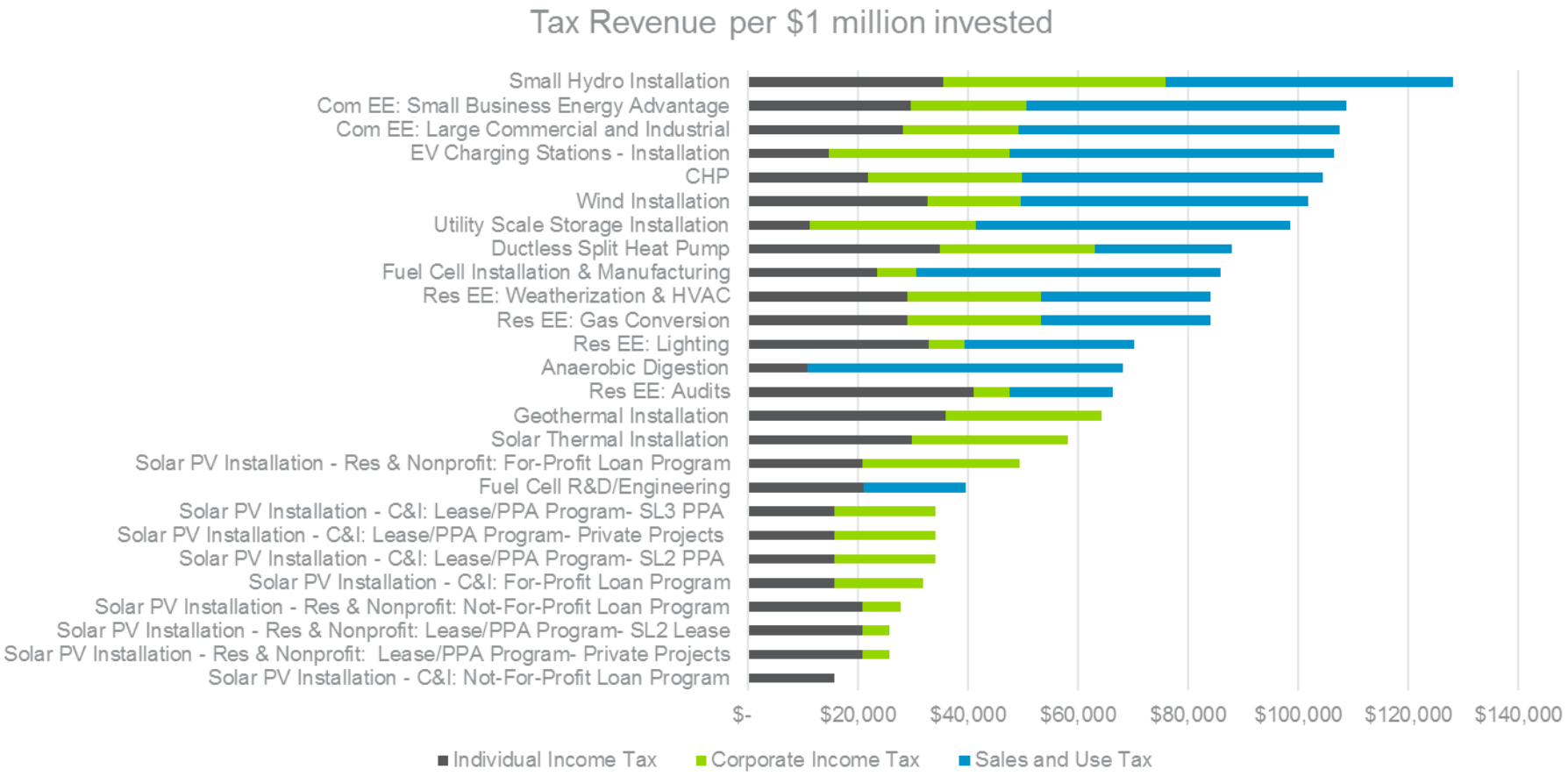
[Sum of non-labor cost] x [% of non-labor not exempt] x [Sales tax rate]

2016 Jobs Calculator — *Dependent on applicable exemption certificates* — *CT Tax Rates*

- The % of non-labor not exempt is:
  - 0% for solar PV, solar thermal, and geothermal
  - 50% for fuel cell R&D
  - 100% for all other technology types

RESULTS:
RANKED BY TOTAL TAX

Across the different project types, the total tax varies significantly, from $10,000 to $128,000 per million dollars invested.



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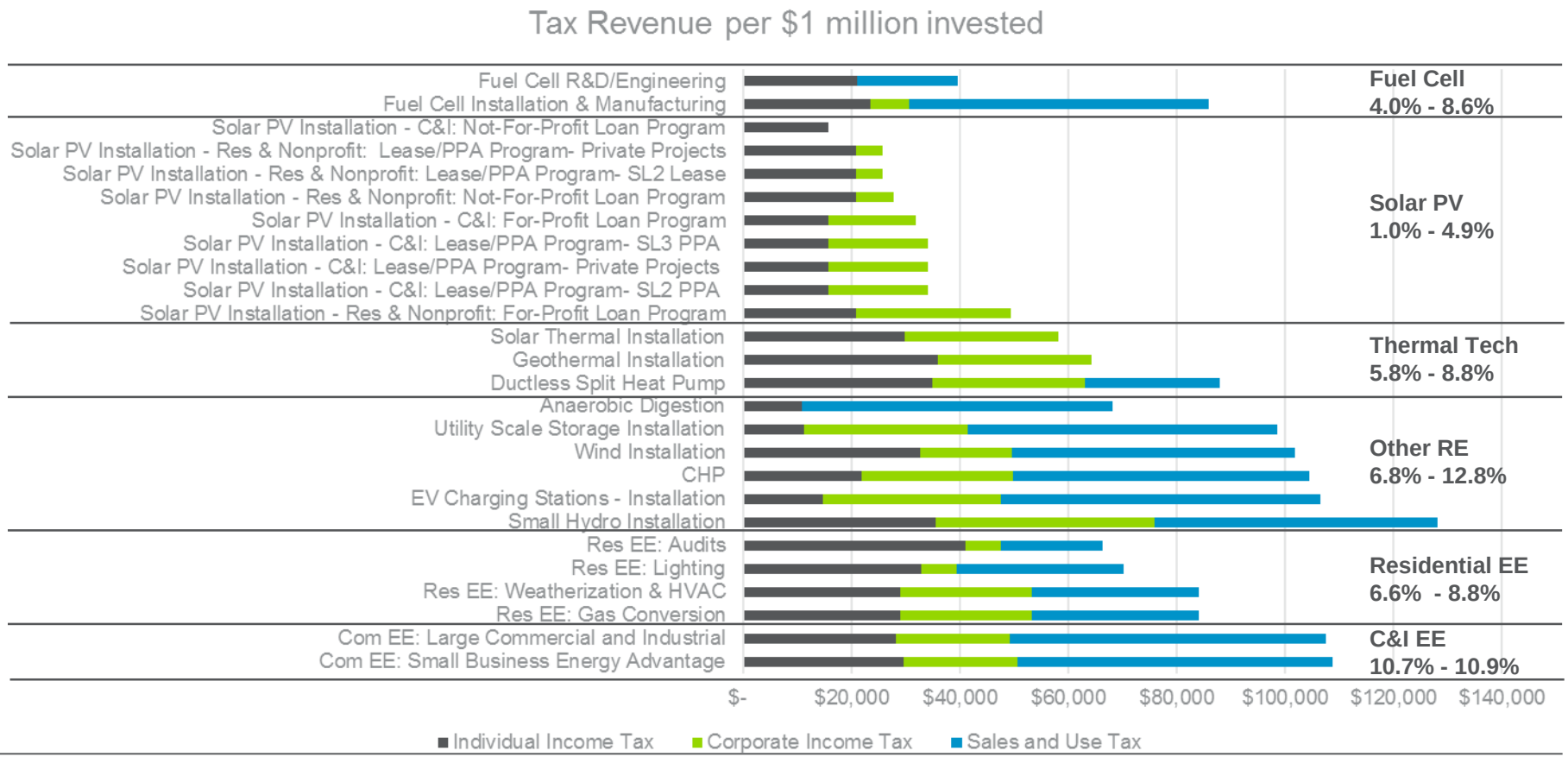
RESULTS:
SORTED BY CATEGORY AND BY TOTAL TAX

There is some spread within a technology category dependent on the project financing method and whether or not it is residential or non-residential.



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RESULTS:
RANGES BY HIGHER LEVEL TECHNOLOGY CATEGORY

Specific drivers impact the difference in tax revenue impacts between various projects and technologies.

Renewable Energy		Tax Revenue as % of project cost
Fuel Cell	All	4.0% - 8.6%
Solar PV	Residential Installation	2.6% - 4.9%
	Non Residential Installation	1.0% - 3.4%
Renewable Thermal Technologies	All	5.8% - 8.8%
Other RE	Anaerobic Digestion	6.8%
	Utility Storage Installation	9.9%
	Wind Installation	10.2%
	CHP	10.4%
	EV Charging Station Installation	10.7%
	Small Hydro Installation	12.8%
Energy Efficiency		**Tax Revenue as % of project cost**
Residential (Single & Multi-Family)	All	6.6% - 8.4%
Commercial	All	10.7% - 10.9%

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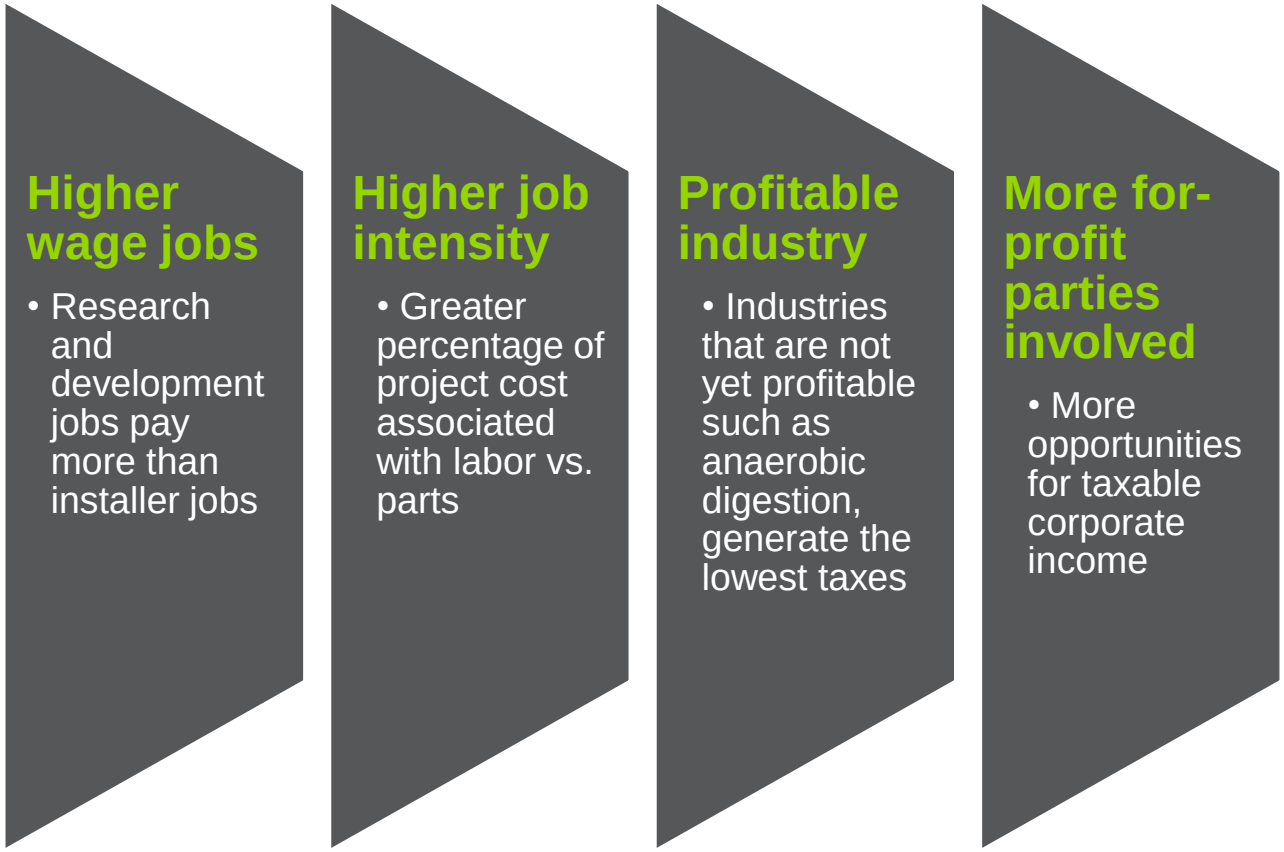
DRIVERS OF HIGHER TAX REVENUE

There are a number of drivers that lead to higher tax revenues for certain projects in the state.



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SOURCES:
INDIRECT/INDUCED JOBS

Indirect and induced job wage was not part of the jobs calculator and therefore was estimated for the tax calculator analysis based on research.

1. NREL Jobs & Economic Development Impact (JEDI) models[1]
   - The models generate the number of indirect and induced jobs and the total earnings based on the project/technology type
   - The models for Conventional Hydropower and Wind specified for CT and inflated to 2016$ calculated an average indirect/induced wage on the **higher side of about $67,000-$70,000**
2. The Solar Foundation, An Assessment of the Economic, Revenue, and Societal Impacts of Colorado's Solar Industry (Oct 2013)[2]
   - The analysis reported the number of indirect and induced jobs and the total earnings for the Colorado solar industry in 2012
   - Inflating to 2016$ and increasing the wage based on the average wage in CT vs CO in 2016, the average indirect/induced wage on the **lower side of about $50,000**
3. Bureau of Labor Statistics, May 2016 State Occupational Employment and Wage Estimates[3]
   - Based on the average report wage of $57,960 across the state of CT in 2016 according to BLS, Navigant estimate an **average indirect/induced wage of $55,000 be used in the tax calculator**

- **We assume the same indirect/induced job wage across all projects/technologies**

[1] National Renewable Energy Laboratory, 01D_JEDI_CSP_Trough_Model_rel._CSP12.23.16, https://www.nrel.gov/analysis/jedi/
[2] The Solar Foundation, http://solarcommunities.org/wp-content/uploads/2013/10/TSF_COSEIA-Econ-Impact-Report_FINAL-VERSION.pdf
[3] BLS, May 2016 State Occupational Employment and Wage Estimates Connecticut, https://www.bls.gov/oes/current/oes_ct.htm

NAVIGANT

SOURCES:
CORPORATE INCOME BEFORE TAX

- Navigant looked at financial data for publicly traded companies that perform renewable energy and energy efficiency installation/EPC services in the US over the 2014-2016 time period
- Benchmark companies included larger diversified construction companies such as Ameresco, EMCOR, MasTec, Quanta Services and Argan and some solar companies such as Vivint and SunRun
- Many of the installers/EPCs in CT are smaller companies. As such, they are privately held and financial data is not public
- The CT Green Bank also reviewed information from qualified CT Green Bank contractors and installers
- Based on this research, for the purposes of modeling corporate income tax, Navigant assumed that **income before tax (or taxable income) was equal to 9% of revenue**

SOURCES:
ONLINE REFERENCES

- CT Eversource C&I base electricity rates:
  - https://www.eversource.com/content/docs/default-source/rates-tariffs/rate30.pdf
  - https://www.eversource.com/content/docs/default-source/rates-tariffs/rate55.pdf
- Sales tax exemptions:
  - http://www.ct.gov/drs/lib/drs/forms/2005forms/certificates/cert-108.pdf
  - http://www.ct.gov/drs/lib/drs/forms/2005forms/certificates/cert-109.pdf
  - http://www.ct.gov/drs/lib/drs/forms/2007forms/salesandusetax/cert-140.pdf
  - http://www.ct.gov/drs/lib/drs/publications/pubsip/2006/ip06-35.pdf
- Percent of project cost provided by tax equity investor:
  - http://greenzu.com/solar-tax-equity-investor-returns
  - https://www.solsystems.com/invest-in-solar/tax-equity/
- Renewable energy technologies that qualified for investment tax credit in 2016:
  - http://programs.dsireusa.org/system/program/detail/658
  - http://www.bakertilly.com/services/renewable-energy/investment-tax-credit-section-48
- CT Corporate Tax Rate – 7.5%
  - http://www.ct.gov/drs/lib/drs/forms/1-2016/corporation/ct-1120.pdf
- CT Individual Income Tax Rate
  - http://www.dir.ct.gov/drs/Taxcalsched/TCS2017.htm

Wage	Individual Income Tax Rate
$ 40,000	3.5%
$ 45,000	4.1%
$ 50,000	4.1%
$ 55,000	4.2%
$ 60,000	4.3%
$ 85,000	5.1%

NAVIGANT

TECHNOLOGY DASHBOARDS

FUEL CELLS

NAVIGANT

FUEL CELL
R&D/ENGINEERING

Description:

We assumed that firms focusing on research and development or engineering work on fuel cells in CT are not yet profitable and are relying on investors for funding. As the fuel cell industry matures, fuel cell engineering or R&D firms may become profitable companies. These firms have the highest direct wage of all of the projects included in the calculator at $85,000.

Parties involved:

R&D/Engineering Frim – not profitable

Drivers:

Inputs:

Average Direct Wage	$85,000
Labor % of Project Cost	40%
Project Lifetime	10 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$20,911
Corporate Income Tax	-
Sales and Use Tax	$18,694
Tax Revenue as % of project cost	4.0%
Rank	18/26

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FUEL CELL
INSTALLATION AND MANUFACTURING

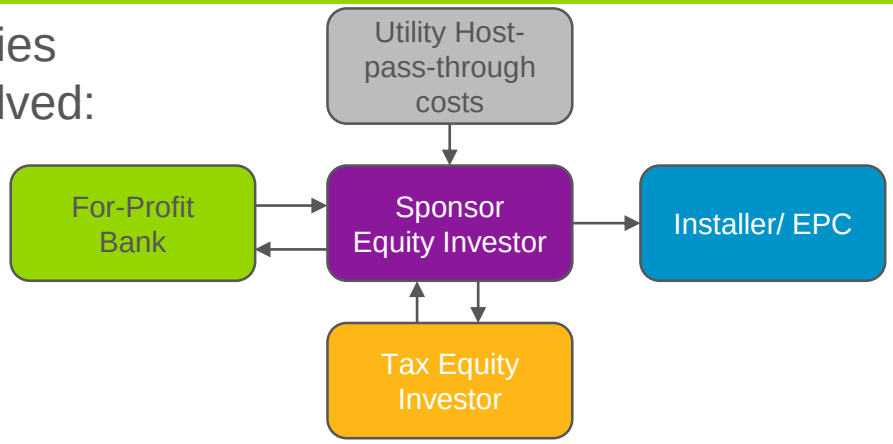
Description:

For fuel cell installation projects, we assumed there are five commercial parties involved: an installer/EPC, the sponsor equity investor, a for-profit bank, the tax equity investor, and the utility host. The sponsor equity investor works with the installer/EPC to get the project installed and uses their own capital, tax equity and some debt to finance the project. The tax equity investor is paid a 4% yearly return on the investment and is bought out at 10% of the investment in year 5. The power from the fuel cell is sold to the utility host. The cost of the power is assumed to be a pass-through cost to the utility customer and does not increase profit for the utility host.

Inputs:

Average Direct Wage	$60,000
Labor % of Project Cost	40%
Project Lifetime	10 years
Average 2016 Cost	$4.87/W
Capacity Factor	90%
% by Tax Equity Investor	40%
Depreciation	5 year MACRS

Parties involved:



Drivers:

Results (per $1 million invested):

Individual Income Tax	$23,489
Corporate Income Tax	$7,108
Sales and Use Tax	$55,195
Tax Revenue as % of project cost	8.6%
Rank	9/26

NAVIGANT

TECHNOLOGY DASHBOARDS

SOLAR PV

NAVIGANT

SOLAR PV – LOAN PROGRAM
FOR-PROFIT BANK, RESIDENTIAL AND NONPROFIT

Description:

When a residential or nonprofit host takes out a loan to install a solar PV project from a for-profit bank, the three parties involved are the host, the bank, and the installer/EPC. We assumed that the host takes out a loan for 100% of the project cost and the loan term is 15 years. The residential or nonprofit host benefits from not paying for power from their own panels, lowering their overall energy bills. However, since the host in this scenario doesn't pay income tax, their taxes are not impacted as a result of lower energy bills, which is the case for a C&I host. The cost per watt and the PPA price for these projects is approximately 30% higher than for C&I projects.

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	35%
Project Lifetime	25 years
Average 2016 Cost	$2.98/W
Capacity Factor	13.7%
% by Tax Equity Investor	-
Depreciation	-

Parties involved:

Drivers:

Results (per $1 million invested):

Individual Income Tax	$20,878
Corporate Income Tax	$28,387
Sales and Use Tax	-
Tax Revenue as % of project cost	4.9%
Rank	17/26

NAVIGANT

SOLAR PV – LOAN PROGRAM
FOR-PROFIT BANK, C&I

Description:

When a C&I business takes out a loan to install a solar PV project from a for-profit bank, the three parties involved are the host, the bank, and the installer/EPC. We assumed that the host takes out a loan for 100% of the project cost and the loan term is 15 years. The C&I business benefits from lower overall energy bills, leading to lower operating costs and increasing their income accordingly. However, the C&I host can deduct the interest payments and the depreciation of the panels from their increased income. We found a net negative NPV of the decreased energy bills, interest payments, and depreciation for the C&I host, lowering their income taxes.

Inputs:

Average Direct Wage	$50,000
Labor % of Project Cost	25%
Project Lifetime	25 years
Average 2016 Cost	$2.30/W
Capacity Factor	13.7%
% by Tax Equity Investor	-
Depreciation	5 year MACRS

Parties involved:

Drivers:

Results (per $1 million invested):

Individual Income Tax	$20,641
Corporate Income Tax	$16,117
Sales and Use Tax	-
Tax Revenue as % of project cost	3.2%
Rank	22/26

NAVIGANT

SOLAR PV – LOAN PROGRAM
NOT-FOR-PROFIT BANK, RESIDENTIAL AND NONPROFIT

Description:

When a residential or nonprofit host takes out a loan to install a solar PV project from a not-for-profit bank, the three parties involved are the host, the bank, and the installer/EPC. We assumed that the host takes out a loan for 100% of the project cost and the loan term is 15 years. The not-for-profit bank does not pay taxes on the interest paid on the loan. The residential or nonprofit host benefits from not paying for power from their own panels, lowering their overall energy bills. However, since the host in this scenario doesn't pay income tax, their taxes are not impacted as a result of lower energy bills. The cost per watt and the PPA price for these projects is approximately 30% higher than for C&I projects.

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	35%
Project Lifetime	25 years
Average 2016 Cost	$2.98/W
Capacity Factor	13.7%
% by Tax Equity Investor	-
Depreciation	-

Parties involved:

Drivers:

Results (per $1 million invested):

Individual Income Tax	$20,878
Corporate Income Tax	$6,750
Sales and Use Tax	-
Tax Revenue as % of project cost	2.8%
Rank	23/26

NAVIGANT

SOLAR PV – LOAN PROGRAM
NOT-FOR-PROFIT BANK, C&I

Description:

When a C&I business takes out a loan to install a solar PV project from a not-for-profit bank, the three parties involved are the host, the bank, and the installer/EPC. We assumed that the host takes out a loan for 100% of the project cost and the loan term is 15 years. The not-for-profit bank does not pay taxes on the interest paid on the loan. The C&I business benefits from lower overall energy bills, leading to lower operating costs and increasing their income accordingly. However, the C&I host can deduct the interest payments and the depreciation of the panels from their increased income. We found a net negative NPV of the decreased energy bills, interest payments, and depreciation for the C&I host, lowering their income taxes.

Inputs:

Average Direct Wage	$50,000
Labor % of Project Cost	25%
Project Lifetime	25 years
Average 2016 Cost	$2.30/W
Capacity Factor	13.7%
% by Tax Equity Investor	-
Depreciation	5 year MACRS

Parties involved:

Drivers:

Results (per $1 million invested):

Individual Income Tax	$15,641
Corporate Income Tax	-$5,250
Sales and Use Tax	-
Tax Revenue as % of project cost	1.0%
Rank	26/26

NAVIGANT

SOLAR PV – LEASE/PPA PROGRAM
PRIVATE PROJECTS, RESIDENTIAL AND NONPROFIT

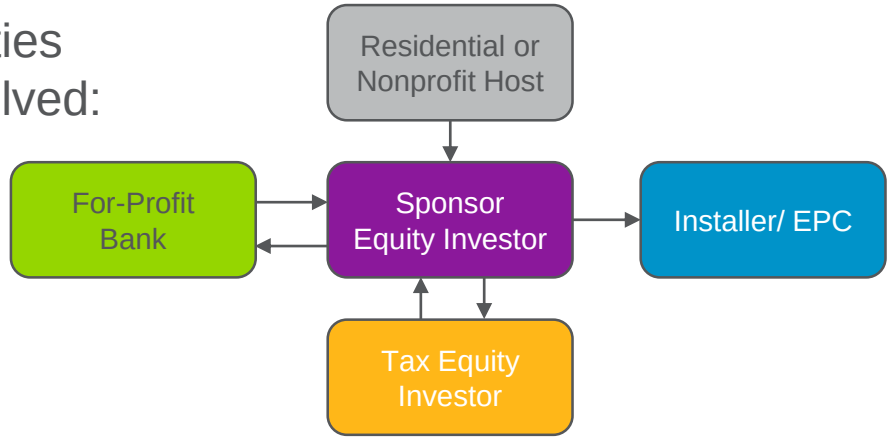
Description:

For a residential or nonprofit private lease/PPA solar PV project, we assumed that there are five parties involved: an installer/EPC, the sponsor equity investor, a for-profit bank, the tax equity investor, and the residential or nonprofit host. The sponsor equity investor works with the installer/EPC to get the project installed and uses their own capital, tax equity and some debt to finance the project. The tax equity investor is paid a 4% yearly return on the investment and is bought out at 10% of the investment in year 5. The residential or nonprofit host benefits from a lower energy price than if they purchased the power from the utility directly. However, since the host doesn't pay income tax, their taxes are not impacted as a result of lower energy bills.

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	35%
Project Lifetime	20 years
Average 2016 Cost	$2.98/W
Capacity Factor	13.7%
% by Tax Equity Investor	40%
Depreciation	5 year MACRS

Parties involved:



Drivers:

Results (per $1 million invested):

Individual Income Tax	$20,878
Corporate Income Tax	$4,874
Sales and Use Tax	-
Tax Revenue as % of project cost	2.6%
Rank	25/26

NAVIGANT

SOLAR PV – LEASE/PPA PROGRAM
PRIVATE PROJECTS, C&I

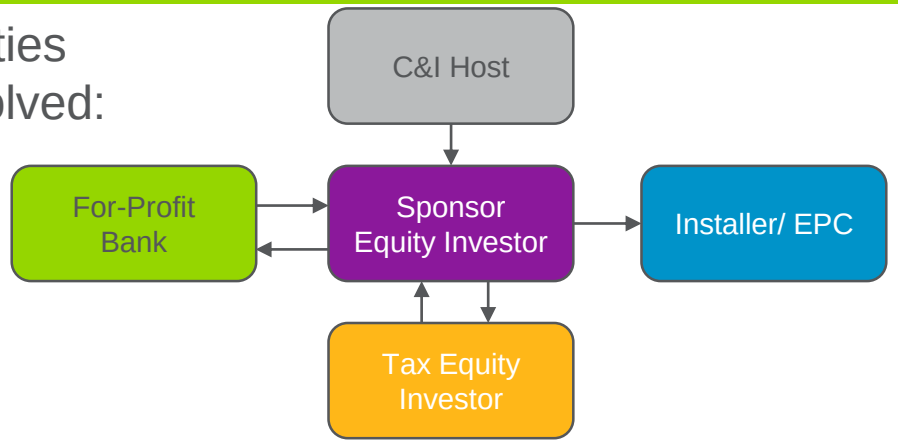
Description:

For a C&I private lease/PPA solar PV project, we assumed that there are five parties involved: an installer/EPC, the sponsor equity investor, a for-profit bank, the tax equity investor, and the C&I host. The sponsor equity investor works with the installer/EPC to get the project installed and uses their own capital, tax equity and some debt to finance the project. The tax equity investor is paid a 4% yearly return on the investment and is bought out at 10% of the investment in year 5. The C&I host benefits from a lower energy price than if they purchased the power from the utility directly, leading to increased taxable income for the C&I host over the lease/PPA term.

Inputs:

Average Direct Wage	$50,000
Labor % of Project Cost	25%
Project Lifetime	20 years
Average 2016 Cost	$2.30/W
Capacity Factor	13.7%
% by Tax Equity Investor	40%
Depreciation	5 year MACRS

Parties involved:



Drivers:

Results (per $1 million invested):

Individual Income Tax	$15,641
Corporate Income Tax	$18,417
Sales and Use Tax	-
Tax Revenue as % of project cost	3.4%
Rank	20/26

NAVIGANT

SOLAR PV – LEASE/PPA PROGRAM
CT GREEN BANK SL2 PROJECTS, RESIDENTIAL AND NONPROFIT

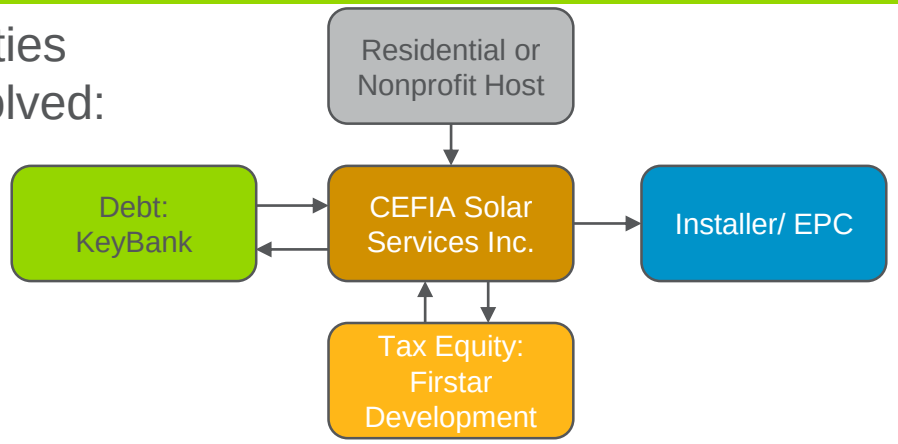
Description:

CT GB created CEFIA Solar Services Inc. to act as the managing member of their SL2 solar PV leases. CEFIA Solar Services Inc. provides a 26% share, the tax equity investor, Firstar Development, provides 35%, and KeyBank provides the remaining. Firstar Development receives a yearly priority return of approximately 2.9% of capital contributed considering the unfunded commitment fee and is bought out at 10% of the investment in year 5. The residential or nonprofit host benefits from a lower energy price than if they purchasing from the utility. However, since the host doesn't pay income tax, their taxes are not impacted. The cost per watt and the lease/PPA price is approximately 30% higher than for C&I projects.

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	35%
Project Lifetime	20 years
Average 2016 Cost	$2.98/W
Capacity Factor	13.7%
% by Tax Equity Investor	40%
Depreciation	5 year MACRS

Parties involved:



Drivers:

Results (per $1 million invested):

Individual Income Tax	$20,878
Corporate Income Tax	$4,874
Sales and Use Tax	-
Tax Revenue as % of project cost	2.6%
Rank	24/26

NAVIGANT

SOLAR PV – LEASE/PPA PROGRAM
CT GREEN BANK SL2 PROJECTS, C&I

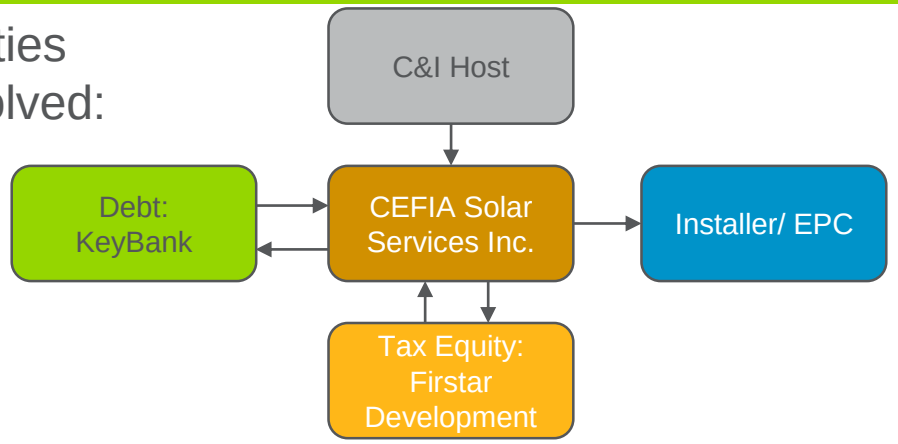
Description:

CT GB created CEFIA Solar Services Inc. to act as the managing member of their SL2 solar PV leases. CEFIA Solar Services Inc. provides a 26% share, the tax equity investor, Firstar Development, provides 35%, and the remaining amount is debt from KeyBank. Firstar Development receives a priority return of approximately 2.9% of capital contributed considering the unfunded commitment fee and is bought out at 10% of the investment in year 5. The C&I host benefits from a lower energy price than if they purchased the power from the utility directly, leading to increased taxable income for the C&I host over the lease/PPA term.

Inputs:

Average Direct Wage	$50,000
Labor % of Project Cost	25%
Project Lifetime	20 years
Average 2016 Cost	$2.30/W
Capacity Factor	13.7%
% by Tax Equity Investor	40%
Depreciation	5 year MACRS

Parties involved:



Drivers:

Results (per $1 million invested):

Individual Income Tax	$15,641
Corporate Income Tax	$18,417
Sales and Use Tax	-
Tax Revenue as % of project cost	3.4%
Rank	19/26

NAVIGANT

SOLAR PV – LEASE/PPA PROGRAM
CT GREEN BANK SL3 PROJECTS, C&I

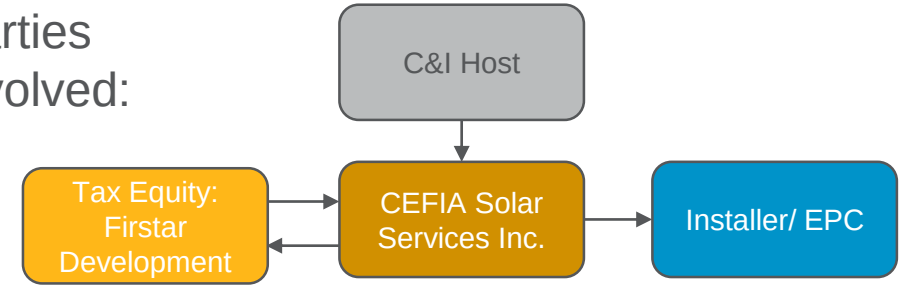
Description:

CT GB created CEFIA Solar Services Inc. to act as the managing member of their SL3 solar PV leases. For the SL3 projects, CEFIA Solar Services Inc. provides a 63.172% share and the tax equity investor, Firstar Development, provides the remaining share of 36.828%. Firstar Development receives a yearly priority return of approximately 2.9% of capital contributed considering the unfunded commitment fee and is bought out at 10% of the investment in year 5. The C&I host benefits from a lower energy price than if they purchased the power from the utility directly, leading to increased taxable income for the C&I host over the lease/PPA term.

Inputs:

Average Direct Wage	$50,000
Labor % of Project Cost	25%
Project Lifetime	20 years
Average 2016 Cost	$2.30/W
Capacity Factor	13.7%
% by Tax Equity Investor	40%
Depreciation	5 year MACRS

Parties involved:



Drivers:

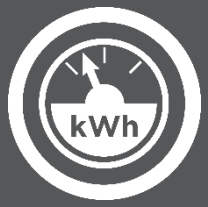
Results (per $1 million invested):

Individual Income Tax	$15,641
Corporate Income Tax	$18,417
Sales and Use Tax	-
Tax Revenue as % of project cost	3.4%
Rank	21/26

NAVIGANT

TECHNOLOGY DASHBOARDS

RENEWABLE THERMAL TECHNOLOGIES



NAVIGANT

RENEWABLE THERMAL TECHNOLOGIES – LOAN
DUCTLESS SPLIT HEAT PUMP

Description:

With the installation of a ductless heat pump, only the host, the installer/EPC, and the for-profit bank are involved in the project. We assumed that the host takes out a loan for 100% of the project cost and the loan term is 15 years. The host can be either a residential, nonprofit, or C&I host since we do not assume that the energy savings are significant enough to lead to increased income taxes considering the deduction of the interest payments. However, for sales tax purposes, we assumed these systems were installed for residential or nonprofit hosts. We assumed that if this system was not installed, another would be for similar cost, so the depreciation would be similar in either case.

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	60%
Project Lifetime	15 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Parties involved:

Drivers:

Results (per $1 million invested):

Individual Income Tax	$34,905
Corporate Income Tax	$28,220
Sales and Use Tax	$24,711
Tax Revenue as % of project cost	8.8%
Rank	8/26

NAVIGANT

RENEWABLE THERMAL TECHNOLOGIES – LOAN
GEOTHERMAL INSTALLATION

Description:

With the installation of a geothermal heating system, only the host, the installer/EPC, and the for-profit bank are involved in the project. We assumed that the host takes out a loan for 100% of the project cost and the loan term is 15 years. The host can be either a residential, nonprofit, or C&I host since we do not assume that the energy savings are significant enough to lead to increased income taxes considering the deduction of the interest payments. We assumed that if this system was not installed, another would be for similar cost, so the depreciation would be similar in either case.

Parties involved:

Drivers:

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	60%
Project Lifetime	25 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$35,791
Corporate Income Tax	$28,387
Sales and Use Tax	-
Tax Revenue as % of project cost	6.4%
Rank	15/26

NAVIGANT

RENEWABLE THERMAL TECHNOLOGIES – LOAN
SOLAR THERMAL INSTALLATION

Description:

With the installation of a solar thermal system, only the host, the installer/EPC, and the for-profit bank are involved in the project. We assumed that the host takes out a loan for 100% of the project cost and the loan term is 15 years. The host can be either a residential, nonprofit, or C&I host since we do not assume that the energy savings are significant enough to lead to increased income taxes considering deduction of the interest payments. We assumed that if this system was not installed, another would be for similar cost, so the depreciation would be similar in either case.

Parties involved:

Drivers:

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	50%
Project Lifetime	20 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$29,826
Corporate Income Tax	$28,387
Sales and Use Tax	-
Tax Revenue as % of project cost	5.8%
Rank	16/26

NAVIGANT

TECHNOLOGY DASHBOARDS

OTHER RENEWABLE ENERGY

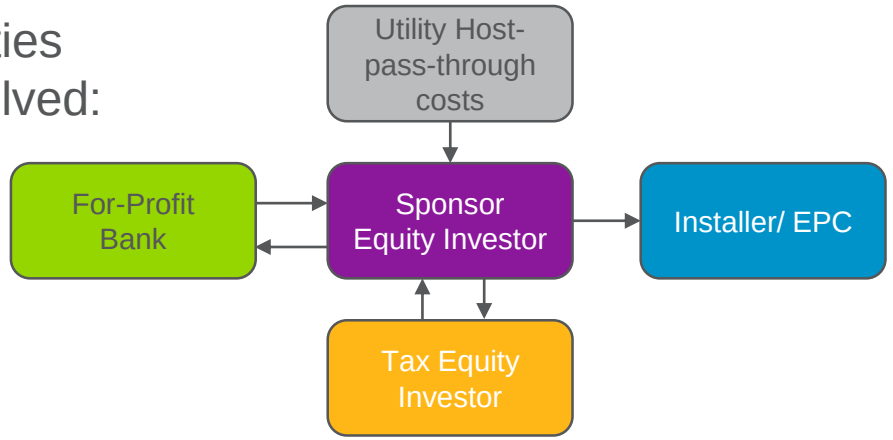
NAVIGANT

OTHER RENEWABLE ENERGY
WIND INSTALLATION

Description:

For a wind installation project, we assumed that there are five parties involved: an installer/EPC, the sponsor equity investor, a for-profit bank, the tax equity investor, and the utility host. The sponsor equity investor works with the installer/EPC to get the project installed and uses their own capital, tax equity and some debt to finance the project. The tax equity investor is paid a 4% yearly return on the investment and is bought out at 10% of the investment in year 5. The wind power is sold to the utility host. The cost of the power is assumed to be a pass-through cost to the utility customer and does not increase profit for the utility host.

Parties involved:



Drivers:

Inputs:

Average Direct Wage	$60,000
Labor % of Project Cost	60%
Project Lifetime	20 years
Average 2016 Cost	$4.96/W
Capacity Factor	18%
% by Tax Equity Investor	40%
Depreciation	5 year MACRS

Results (per $1 million invested):

Individual Income Tax	$32,640
Corporate Income Tax	$16,923
Sales and Use Tax	$52,239
Tax Revenue as % of project cost	10.2%
Rank	6/26

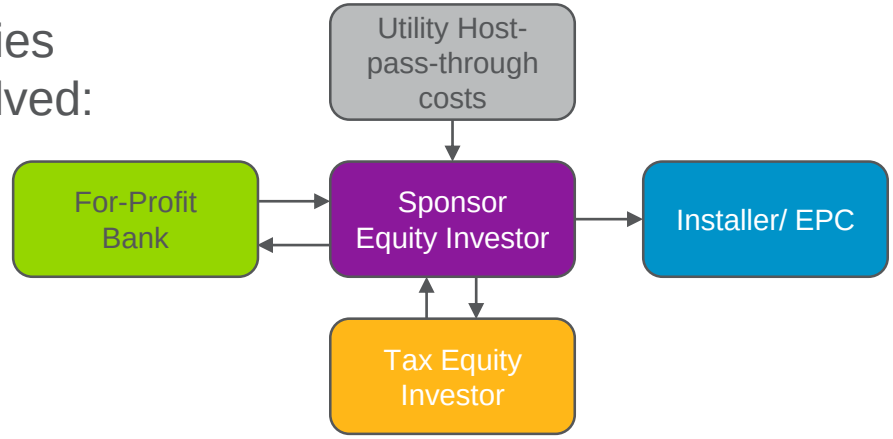
NAVIGANT

OTHER RENEWABLE ENERGY
SMALL HYDRO INSTALLATION

Description:

For a small hydropower project, we assumed that there are five parties involved: an installer/EPC, the sponsor equity investor, a for-profit bank, the tax equity investor, and the utility host. The sponsor equity investor works with the installer/EPC to get the project installed and uses their own capital, tax equity and some debt to finance the project. The tax equity investor is paid a 4% yearly return on the investment and is bought out at 10% of the investment in year 5. The hydropower is sold to the utility host. The cost of the power is assumed to be a pass-through cost to the utility customer and does not increase profit for the utility host.

Parties involved:



Drivers:

Inputs:

Average Direct Wage	$60,000
Labor % of Project Cost	60%
Project Lifetime	20 years
Average 2016 Cost	$2.77/W
Capacity Factor	49%
% by Tax Equity Investor	40%
Depreciation	5 year MACRS

Results (per $1 million invested):

Individual Income Tax	$35,578
Corporate Income Tax	$40,359
Sales and Use Tax	$52,239
Tax Revenue as % of project cost	12.8%
Rank	1/26

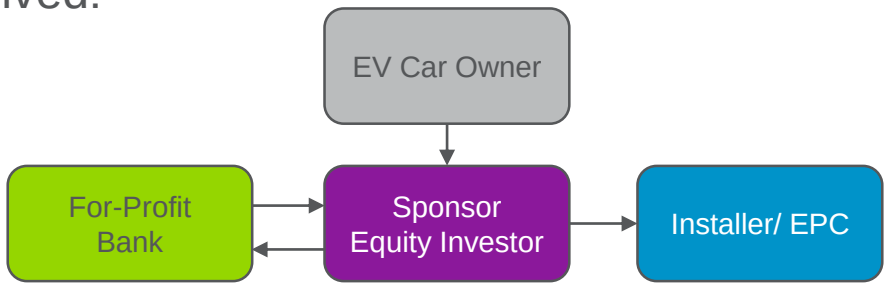
NAVIGANT

OTHER RENEWABLE ENERGY
EV CHARGING STATION INSTALLATION

Description:

For an EV charging station installation project, we assumed that there are four parties involved: an installer/EPC, the sponsor equity investor, a for-profit bank, and the EV car owners that use the charging station. The sponsor equity investor works with the installer/EPC to get the project installed and uses their own capital and debt to finance the project. We assumed that the sponsor equity investor is looking for an IRR of ~10% and will use that to set the price of charging. The sponsor equity investor can depreciate 85% of the project cost.

Parties involved:



Drivers:

Inputs:

Average Direct Wage	$50,000
Labor % of Project Cost	25%
Project Lifetime	20 years
Average 2016 Cost	$2.50/W
Capacity Factor	25%
% by Tax Equity Investor	-
Depreciation	7 year MACRS

Results (per $1 million invested):

Individual Income Tax	$14,718
Corporate Income Tax	$32,872
Sales and Use Tax	$59,006
Tax Revenue as % of project cost	10.7%
Rank	4/26

NAVIGANT

OTHER RENEWABLE ENERGY
UTILITY SCALE STORAGE INSTALLATION

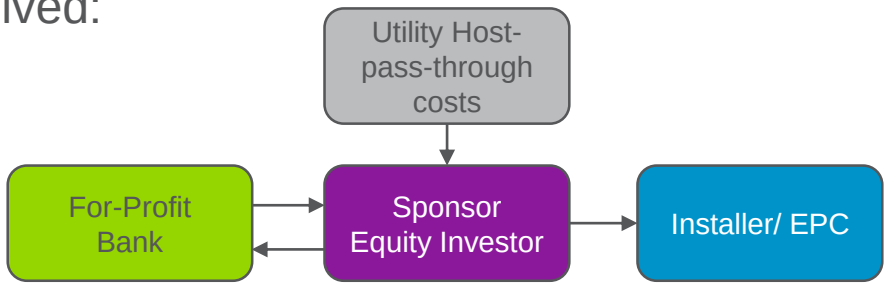
Description:

For a utility scale storage installation project, we assumed that there are four parties involved: an installer/EPC, the sponsor equity investor, a for-profit bank, and the utility host. The sponsor equity investor works with the installer/EPC to get the project installed and uses their own capital and debt to finance the project. We assumed that the sponsor equity investor is looking for an IRR of ~10% and will use that to set the price per kWh. The sponsor equity investor can depreciate 85% of the project cost. The battery power is sold to the utility host. The cost of the power is assumed to be a pass-through cost to the utility customer and does not increase profit for the utility host.

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	20%
Project Lifetime	10 years
Average 2016 Cost	$1.50/W
Capacity Factor	17%
% by Tax Equity Investor	-
Depreciation	7 year MACRS

Parties involved:



Drivers:

Results (per $1 million invested):

Individual Income Tax	$11,248
Corporate Income Tax	$30,143
Sales and Use Tax	$57,232
Tax Revenue as % of project cost	9.9%
Rank	7/26

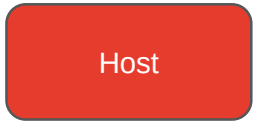
NAVIGANT

OTHER RENEWABLE ENERGY
ANAEROBIC DIGESTION

Description:

We assumed that for anaerobic digestion projects, the only key player is the host of the anaerobic digestion project. However, this technology is still in the development stage and we assumed that it is not yet profitable. As the anaerobic digestion industry matures, anaerobic digestion projects may become profitable.

Parties involved:



Drivers:

Inputs:

Average Direct Wage	$60,000
Labor % of Project Cost	20%
Project Lifetime	15 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$10,823
Corporate Income Tax	-
Sales and Use Tax	$57,232
Tax Revenue as % of project cost	6.8%
Rank	13/26

NAVIGANT

OTHER RENEWABLE ENERGY
COMBINED HEAT AND POWER (CHP)

Description:

We assumed that for a combined heat and power plant it will be owned by the commercial entity or host and located on their site. The other players are the for-profit bank and the installer/EPC. We assumed that the host takes out a loan for 100% of the project cost and the loan term is 15 years. The host can be either a nonprofit or C&I host since we do not assume that the energy savings are significant enough to lead to increased income taxes considering deduction of the interest payments. We assumed that if this system was not installed, another would be for similar cost, so the depreciation would be similar in either case.

Parties involved:

Drivers:

Inputs:

Average Direct Wage	$60,000
Labor % of Project Cost	40%
Project Lifetime	15 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$21,703
Corporate Income Tax	$28,017
Sales and Use Tax	$54,742
Tax Revenue as % of project cost	10.4%
Rank	5/26

NAVIGANT

TECHNOLOGY DASHBOARDS

ENERGY EFFICIENCY

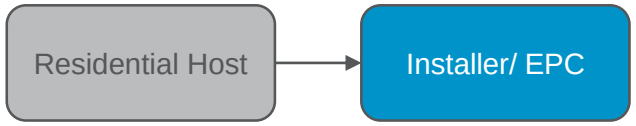
NAVIGANT

RESIDENTIAL ENERGY EFFICIENCY LIGHTING

Description:

The jobs and corporate income generated from a residential energy efficiency lighting upgrade are only when the lighting is installed by someone besides the homeowner. Lighting upgrades are usually low cost and we assumed that the residential host does not take out a loan to finance the upgrade. For this reason, only the installer/EPC has increased taxes from these projects.

Parties involved:



Drivers:

Inputs:

Average Direct Wage	$40,000
Labor % of Project Cost	50%
Project Lifetime	12 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$32,867
Corporate Income Tax	$6,542
Sales and Use Tax	$30,773
Tax Revenue as % of project cost	7.0%
Rank	12/26

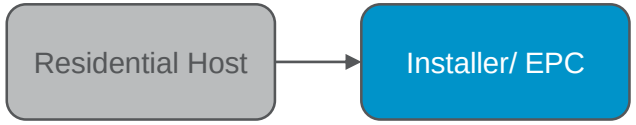
NAVIGANT

RESIDENTIAL ENERGY EFFICIENCY AUDITS

Description:

The jobs and corporate income generated from a residential energy efficiency audit are only when the audit is performed by someone besides the homeowner. Audits are usually low cost and we assumed that the residential host does not take out a loan to finance the audit. For this reason, only the installer/EPC has increased taxes from these projects. The labor is not the full cost of the project due to the cost of the equipment needed to conduct the audit such as for a blower door test.

Parties involved:



Drivers:

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	70%
Project Lifetime	-
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$40,976
Corporate Income Tax	$6,624
Sales and Use Tax	$18,694
Tax Revenue as % of project cost	6.6%
Rank	14/26

NAVIGANT

RESIDENTIAL ENERGY EFFICIENCY
WEATHERIZATION & HVAC

Description:

The jobs and corporate income generated from residential energy efficiency weatherization and HVAC upgrades are only when the work is performed by someone besides the homeowner. HVAC and weatherization upgrades can be more expensive and we assumed that the residential host takes out a loan to finance 100% of the upgrade. The three parties involved in the upgrade are the residential host, the for-profit bank, and the installer/EPC.

Parties involved:

Drivers:

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	50%
Project Lifetime	12 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$28,908
Corporate Income Tax	$24,364
Sales and Use Tax	$30,772
Tax Revenue as % of project cost	8.4%
Rank	11/26

NAVIGANT

RESIDENTIAL ENERGY EFFICIENCY
GAS CONVERSION

Description:

The jobs and corporate income generated from residential gas conversion are only when the work is performed by someone besides the homeowner. Gas conversion can be more expensive and we assumed that the residential host takes out a loan to finance 100% of the conversion. The three parties involved in the upgrade are the residential host, the for-profit bank, and the installer/EPC.

Parties involved:

Drivers:

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	50%
Project Lifetime	12 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$28,908
Corporate Income Tax	$24,364
Sales and Use Tax	$30,772
Tax Revenue as % of project cost	8.4%
Rank	10/26

NAVIGANT

COMMERCIAL ENERGY EFFICIENCY
SMALL BUSINESS ENERGY ADVANTAGE

Description:

For commercial energy efficiency projects at small businesses, we assumed that there are three parties involved: the small business host, the for-profit bank, and the installer/EPC. We assumed that the small business takes out a loan to finance 100% of the energy efficiency upgrades. The energy efficiency upgrades will reduce overall energy costs for the small business and increase profit. The small business can deduct their interest payments from the increased profits. Assuming a cost of $5/kWh saved per year, the small business has a net increase in income over the 12 year life of the upgrade.

Parties involved:

Drivers:

Inputs:

Average Direct Wage	$50,000
Labor % of Project Cost	50%
Project Lifetime	12 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$29,459
Corporate Income Tax	$21,074
Sales and Use Tax	$58,303
Tax Revenue as % of project cost	10.9%
Rank	2/26

NAVIGANT

COMMERCIAL ENERGY EFFICIENCY
LARGE COMMERCIAL AND INDUSTRIAL

Description:

For commercial energy efficiency projects at large commercial and industrial sites, we assumed that there are three parties involved: the large C&I host, the for-profit bank, and the installer/EPC. We assumed that the large C&I host takes out a loan to finance 100% of the energy efficiency upgrades. The energy efficiency upgrades will reduce overall energy costs for the C&I host and accordingly increase profit. The C&I host can deduct their interest payments from the increased profits. Assuming a cost of $5/kWh saved per year, the C&I host has a net increase income over the 12 year life of the upgrade.

Parties involved:

Drivers:

Inputs:

Average Direct Wage	$55,000
Labor % of Project Cost	50%
Project Lifetime	12 years
Average 2016 Cost	-
Capacity Factor	-
% by Tax Equity Investor	-
Depreciation	-

Results (per $1 million invested):

Individual Income Tax	$28,087
Corporate Income Tax	$21,074
Sales and Use Tax	$58,303
Tax Revenue as % of project cost	10.7%
Rank	3/26

NAVIGANT

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NAVIGANT

NAVIGANT

Project/Technology Type	All-in Project Cost including Sales and Use Tax	Project investment before sales and use tax	Company Overhead (SG&A) and Margin (%)	Project Cost After Overhead (SG&A) and Margin	Labor (% of Project Cost)	Non-Labor (% of Project Cost)	Weighted Average Direct Job Wage	CT Income Tax Rate Direct Job	Fully Burdened Employee Cost	Direct Job Years Created per Project
Renewable Energy	$1,000,000	A=All in Project Cost-AC	B	C=(1-B)*A	D	E=(1-D)	F	G	H=F*1.3	I=C*(D/H)
Fuel Cell										
Fuel Cell R&D/Engineering- *assume not profitable*	$ 1,000,000	$ 981,306	20%	$ 785,045	40%	60%	$ 85,000	5.1%	$ 110,500	2.8
Fuel Cell Installation and Manufacturing- *assume not pro*	$ 1,000,000	$ 944,805	20%	$ 755,844	40%	60%	$ 60,000	4.3%	$ 78,000	3.9
Solar PV- For-Profit Bank Loan Program										
Solar PV Installation - Residential & Non-profits	$ 1,000,000	$ 1,000,000	20%	$ 800,000	35%	65%	$ 55,000	4.2%	$ 71,500	3.9
Solar PV Installation - C&I	$ 1,000,000	$ 1,000,000	20%	$ 800,000	25%	75%	$ 50,000	4.1%	$ 65,000	3.1
Solar PV- Not-For-Profit Bank Loan Program										
Solar PV Installation - Residential & Nonprofits	$ 1,000,000	$ 1,000,000	20%	$ 800,000	35%	65%	$ 55,000	4.2%	$ 71,500	3.9
Solar PV Installation - C&I	$ 1,000,000	$ 1,000,000	20%	$ 800,000	25%	75%	$ 50,000	4.1%	$ 65,000	3.1
Solar PV- Lease/PPA Program- Private Projects										
Solar PV Installation - Residential & Nonprofits	$ 1,000,000	$ 1,000,000	20%	$ 800,000	35%	65%	$ 55,000	4.2%	$ 71,500	3.9
Solar PV Installation - C&I	$ 1,000,000	$ 1,000,000	20%	$ 800,000	25%	75%	$ 50,000	4.1%	$ 65,000	3.1
Solar PV- Lease/PPA Program- CGB Projects										
SL2 Lease- Solar PV Installation - Residential & Nonprof	$ 1,000,000	$ 1,000,000	20%	$ 800,000	35%	65%	$ 55,000	4.2%	$ 71,500	3.9
SL2 PPA-Solar PV Installation - C&I	$ 1,000,000	$ 1,000,000	20%	$ 800,000	25%	75%	$ 50,000	4.1%	$ 65,000	3.1
SL3 PPA-Solar PV Installation - C&I	$ 1,000,000	$ 1,000,000	20%	$ 800,000	25%	75%	$ 50,000	4.1%	$ 65,000	3.1
Renewable Thermal Technologies -Loan										
Ductless Split Heat Pump	$ 1,000,000	$ 975,229	20%	$ 780,183	60%	40%	$ 55,000	4.2%	$ 71,500	6.5
Geothermal Installation	$ 1,000,000	$ 1,000,000	20%	$ 800,000	60%	40%	$ 55,000	4.2%	$ 71,500	6.7
Solar Thermal Installation	$ 1,000,000	$ 1,000,000	20%	$ 800,000	50%	50%	$ 55,000	4.2%	$ 71,500	5.6
Other										
Wind Installation -*assume profitable*	$ 1,000,000	$ 947,761	20%	$ 758,209	60%	40%	$ 60,000	4.3%	$ 78,000	5.8
Small Hydro Installation -*assume profitable*	$ 1,000,000	$ 947,761	20%	$ 758,209	60%	40%	$ 60,000	4.3%	$ 78,000	5.8
EV Charging Stations - Installation -*assume profitable*	$ 1,000,000	$ 940,994	20%	$ 752,795	25%	75%	$ 50,000	4.1%	$ 65,000	2.9
Utility Scale Storage Installation -*assume profitable*	$ 1,000,000	$ 942,768	20%	$ 754,215	20%	80%	$ 55,000	4.2%	$ 71,500	2.1
Anaerobic Digestion- *assume not profitable*	$ 1,000,000	$ 942,768	20%	$ 754,215	20%	80%	$ 60,000	4.3%	$ 78,000	1.9
CHP- *assumed owned by commercial entity*	$ 1,000,000	$ 945,258	20%	$ 756,207	40%	60%	$ 60,000	4.3%	$ 78,000	3.9
Energy Efficiency										
Residential (Single and Multi-Family)- Loan										
Lighting	$ 1,000,000	$ 969,227	20%	$ 775,382	50%	50%	$ 40,000	3.5%	$ 52,000	7.5
Home Energy Solutions (HES) - Audits	$ 1,000,000	$ 981,306	20%	$ 785,045	70%	30%	$ 55,000	4.2%	$ 71,500	7.7
HES - Weatherization & HVAC	$ 1,000,000	$ 969,227	20%	$ 775,382	50%	50%	$ 55,000	4.2%	$ 71,500	5.4
Gas Conversion	$ 1,000,000	$ 969,227	20%	$ 775,382	50%	50%	$ 55,000	4.2%	$ 71,500	5.4
Commercial- Loan										
Small Business Energy Advantage	$ 1,000,000	$ 941,697	20%	$ 753,358	50%	50%	$ 50,000	4.1%	$ 65,000	5.8
Large Commercial and Industrial	$ 1,000,000	$ 941,697	20%	$ 753,358	50%	50%	$ 55,000	4.2%	$ 71,500	5.3

Project/Technology Type	Indirect & Induced Jobs Multiplier	Indirect & Induced Jobs Years Created per Project	Total Job-Years Created from Capital Invested	Average Induced & Indirect Job Wage	CT Income Tax Rate Induced Job	Individual Income Tax	Installer/EPC Project Profit Before Tax (Taxable-Income)- Year 1	NPV of Sponsor Equity Investor Taxable Income	NPV of for Profit Loan Proceeds Taxable Income Over Useful Life	NPV of Change in Host Taxable Income Over Useful Life- (Increased profit from buying power cheaper than traditional)
Renewable Energy	J	K=J*I	L=I+K	M	N	O=((I*F*G)+(K*M*N))	P=A*Assumed Taxable Income	Q	R	S
Fuel Cell										
Fuel Cell R&D/Engineering- *assume not profitable*	1.3	3.7	**6.5**	$ 55,000	4.2%	$ 20,911				
Fuel Cell Installation and Manufacturing- *assume not pro*	1.5	5.8	**9.7**	$ 55,000	4.2%	$ 23,489		$ 448,743	$ 100,979	
Solar PV- For-Profit Bank Loan Program								25 years		
Solar PV Installation - Residential & Non-profits	1.3	5.1	**9.0**	$ 55,000	4.2%	$ 20,878	$ 70,000		$ 288,490	
Solar PV Installation - C&I	1.3	4.0	**7.1**	$ 55,000	4.2%	$ 15,641	$ 70,000		$ 288,490	$ (163,596)
Solar PV- Not-For-Profit Bank Loan Program								25 years		
Solar PV Installation - Residential & Nonprofits	1.3	5.1	**9.0**	$ 55,000	4.2%	$ 20,878	$ 70,000			
Solar PV Installation - C&I	1.3	4.0	**7.1**	$ 55,000	4.2%	$ 15,641	$ 70,000			$ (163,596)
Solar PV- Lease/PPA Program- Private Projects								20 years		
Solar PV Installation - Residential & Nonprofits	1.3	5.1	**9.0**	$ 55,000	4.2%	$ 20,878	$ 70,000	$ 312,259	$ 144,245	
Solar PV Installation - C&I	1.3	4.0	**7.1**	$ 55,000	4.2%	$ 15,641	$ 70,000	$ 312,851	$ 144,245	$ 179,981
Solar PV- Lease/PPA Program- CGB Projects								20 years		
SL2 Lease- Solar PV Installation - Residential & Nonprof	1.3	5.1	**9.0**	$ 55,000	4.2%	$ 20,878	$ 70,000	$ 373,238	$ 112,511	
SL2 PPA-Solar PV Installation - C&I	1.3	4.0	**7.1**	$ 55,000	4.2%	$ 15,641	$ 70,000	$ 373,830	$ 112,511	$ 179,981
SL3 PPA-Solar PV Installation - C&I	1.3	4.0	**7.1**	$ 55,000	4.2%	$ 15,641	$ 70,000	$ 482,614		$ 179,981
Renewable Thermal Technologies -Loan										
Ductless Split Heat Pump	1.3	8.5	**15.1**	$ 55,000	4.2%	$ 34,905	$ 68,266		$ 288,490	
Geothermal Installation	1.3	8.7	**15.4**	$ 55,000	4.2%	$ 35,791	$ 70,000		$ 288,490	
Solar Thermal Installation	1.3	7.3	**12.9**	$ 55,000	4.2%	$ 29,826	$ 70,000		$ 288,490	
Other										
Wind Installation -*assume profitable*	1.3	7.6	**13.4**	$ 55,000	4.2%	$ 32,640	$ 66,343	$ 452,458	$ 144,245	
Small Hydro Installation -*assume profitable*	1.3	7.6	**13.4**	$ 55,000	4.2%	$ 32,640	$ 66,343	$ 764,943	$ 144,245	
EV Charging Stations - Installation -*assume profitable*	1.3	3.8	**6.7**	$ 55,000	4.2%	$ 14,718	$ 65,870	$ 93,963	$ 259,641	
Utility Scale Storage Installation -*assume profitable*	1.3	2.7	**4.9**	$ 55,000	4.2%	$ 11,248	$ 65,994	$ 135,293	$ 181,762	
Anaerobic Digestion- *assume not profitable*	1.3	2.5	**4.4**	$ 55,000	4.2%	$ 10,823				
CHP- *assumed owned by commercial entity*	1.3	5.0	**8.9**	$ 55,000	4.2%	$ 21,703	$ 66,168		$ 288,490	
Energy Efficiency										
Residential (Single and Multi-Family)- Loan										
Lighting	1.3	9.7	**17.1**	$ 55,000	4.2%	$ 32,867	$ 67,846			
Home Energy Solutions (HES) - Audits	1.3	10.0	**17.7**	$ 55,000	4.2%	$ 40,976	$ 68,691			
HES - Weatherization & HVAC	1.3	7.0	**12.5**	$ 55,000	4.2%	$ 28,908	$ 67,846		$ 237,624	
Gas Conversion	1.3	7.0	**12.5**	$ 55,000	4.2%	$ 28,908	$ 67,846		$ 237,624	
Commercial- Loan										
Small Business Energy Advantage	1.3	7.5	**13.3**	$ 55,000	4.2%	$ 29,459	$ 65,919		$ 237,624	$ (41,385)
Large Commercial and Industrial	1.3	6.8	**12.1**	$ 55,000	4.2%	$ 28,087	$ 65,919		$ 237,624	$ (41,385)

Project/Technology Type	Connecticut Corporate Tax Rate	NPV of Tax Equity Investor Net State Taxes	Corporate Income Tax	Total Income Tax per Million	Sales and Use Tax Exemption Certification Number	Sales and Use Tax Rate	Res/Non-res	% of Labor that is Engineering/Design (based on interviews for jobs calculator)	CT Sales and Use Tax Labor per $1,000,000 *(these do not change based on actual project size)*	CT Sales and Use Tax Non-Labor per $1,000,000 *(these do not change based on actual project size)*	CT Total Sales and Use Tax % of 1,000,000	CT Sales and Use Tax *(based on all-in project cost)*	Income Taxes, Corporate Business Taxes, and Sales Taxes *(based on all-in project cost)*	% of Investment Returned in Income Taxes, Corporate Business Taxes, and Sales Taxes
Renewable Energy	7.5%	T	U=Corporate Tax Rate*(P+Q+R+S)+T	V=O+U	W= Exemption	6.35%	X=Res or Non-res	Y	Z=(1-Y)*1,000,000*D*Sales Tax Rate *as applicable*	AA=1,000,000*E*Sales Tax Rate *as applicable*	AB=(Z+AA)/1,000,000		AC=V+AB	AD=AC/A
Fuel Cell														
Fuel Cell R&D/Engineering- *assume not profitable*	7.5%		$ -	$ 20,911	CERT-108 and CERT	6.35%	Non-res	100%	$ -	$ 19,050	1.9%	$ 18,694	$ 39,605	4.0%
Fuel Cell Installation and Manufacturing- *assume not pro*	7.5%	$ (34,121)	$ 7,108	$ 30,598	NA	6.35%	Non-res	20%	$ 20,320	$ 38,100	5.8%	$ 55,195	$ 85,793	8.6%
Solar PV- For-Profit Bank Loan Program														
Solar PV Installation - Residential & Non-profits	7.5%		$ 26,887	$ 47,765	CERT- 140	6.35%	Res	17%	$ -	$ -	0.0%	$ -	$ 47,765	4.8%
Solar PV Installation - C&I	7.5%		$ 14,617	$ 30,258	CERT- 140	6.35%	Non-res	13%	$ -	$ -	0.0%	$ -	$ 30,258	3.0%
Solar PV- Not-For-Profit Bank Loan Program														
Solar PV Installation - Residential & Nonprofits	7.5%		$ 5,250	$ 26,128	CERT- 140	6.35%	Res	17%	$ -	$ -	0.0%	$ -	$ 26,128	2.6%
Solar PV Installation - C&I	7.5%		$ (7,020)	$ 8,622	CERT- 140	6.35%	Non-res	13%	$ -	$ -	0.0%	$ -	$ 8,622	0.9%
Solar PV- Lease/PPA Program- Private Projects														
Solar PV Installation - Residential & Nonprofits	7.5%	$ (36,114)	$ 3,374	$ 24,252	CERT- 140	6.35%	Res	17%	$ -	$ -	0.0%	$ -	$ 24,252	2.4%
Solar PV Installation - C&I	7.5%	$ (36,114)	$ 16,917	$ 32,558	CERT- 140	6.35%	Non-res	13%	$ -	$ -	0.0%	$ -	$ 32,558	3.3%
Solar PV- Lease/PPA Program- CGB Projects														
SL2 Lease- Solar PV Installation - Residential & Nonprof	7.5%	$ (38,307)	$ 3,374	$ 24,252	CERT- 140	6.35%	Res	17%	$ -	$ -	0.0%	$ -	$ 24,252	2.4%
SL2 PPA-Solar PV Installation - C&I	7.5%	$ (38,307)	$ 16,917	$ 32,558	CERT- 140	6.35%	Non-res	13%	$ -	$ -	0.0%	$ -	$ 32,558	3.3%
SL3 PPA-Solar PV Installation - C&I	7.5%	$ (38,028)	$ 16,917	$ 32,558	CERT- 140	6.35%	Non-res	13%	$ -	$ -	0.0%	$ -	$ 32,558	3.3%
Renewable Thermal Technologies -Loan														
Ductless Split Heat Pump	7.5%		$ 26,757	$ 61,661	NA	6.35%	Res	5%	$ -	$ 25,400	2.5%	$ 24,771	$ 86,432	8.6%
Geothermal Installation	7.5%		$ 26,887	$ 62,678	CERT- 140	6.35%	Res	5%	$ -	$ -	0.0%	$ -	$ 62,678	6.3%
Solar Thermal Installation	7.5%		$ 26,887	$ 56,713	CERT- 140	6.35%	Res	5%	$ -	$ -	0.0%	$ -	$ 56,713	5.7%
Other														
Wind Installation -*assume profitable*	7.5%	$ (34,228)	$ 15,501	$ 48,141	NA	6.35%	Non-res	22%	$ 29,718	$ 25,400	5.5%	$ 52,239	$ 100,380	10.0%
Small Hydro Installation -*assume profitable*	7.5%	$ (34,228)	$ 38,937	$ 71,578	NA	6.35%	Non-res	22%	$ 29,718	$ 25,400	5.5%	$ 52,239	$ 123,816	12.4%
EV Charging Stations - Installation -*assume profitable*	7.5%		$ 31,461	$ 46,179	NA	6.35%	Non-res	5%	$ 15,081	$ 47,625	6.3%	$ 59,006	$ 105,185	10.5%
Utility Scale Storage Installation -*assume profitable*	7.5%		$ 28,729	$ 39,976	NA	6.35%	Non-res	22%	$ 9,906	$ 50,800	6.1%	$ 57,232	$ 97,208	9.7%
Anaerobic Digestion- *assume not profitable*	7.5%		$ -	$ 10,823	NA	6.35%	Non-res	22%	$ 9,906	$ 50,800	6.1%	$ 57,232	$ 68,054	6.8%
CHP- *assumed owned by commercial entity*	7.5%		$ 26,599	$ 48,302	NA	6.35%	Non-res	22%	$ 19,812	$ 38,100	5.8%	$ 54,742	$ 103,044	10.3%
Energy Efficiency														
Residential (Single and Multi-Family)- Loan														
Lighting	7.5%		$ 5,088	$ 37,956	NA	6.35%	Res	5%	$ -	$ 31,750	3.2%	$ 30,773	$ 68,729	6.9%
Home Energy Solutions (HES) - Audits	7.5%		$ 5,152	$ 46,128	NA	6.35%	Res	5%	$ -	$ 19,050	1.9%	$ 18,694	$ 64,822	6.5%
HES - Weatherization & HVAC	7.5%		$ 22,910	$ 51,818	NA	6.35%	Res	5%	$ -	$ 31,750	3.2%	$ 30,773	$ 82,591	8.3%
Gas Conversion	7.5%		$ 22,910	$ 51,818	NA	6.35%	Res	5%	$ -	$ 31,750	3.2%	$ 30,773	$ 82,591	8.3%
Commercial- Loan														
Small Business Energy Advantage	7.5%		$ 19,662	$ 49,120	NA	6.35%	Non-res	5%	$ 30,163	$ 31,750	6.2%	$ 58,303	$ 107,423	10.7%
Large Commercial and Industrial	7.5%		$ 19,662	$ 47,749	NA	6.35%	Non-res	5%	$ 30,163	$ 31,750	6.2%	$ 58,303	$ 106,052	10.6%

Exemption Certificate #	Exemption Certificate Name	Labor	Non-Labor
NA	No Exemption	Not-exempt	Not-exempt
CERT-108 and CERT-109	Partial Exemption of Materials, Tools, and Fuels and Partial Exemption for Machinery, Equipment, or Repair and Replacement Parts	Not-exempt	50% Exempt
CERT- 140	Solar Heating Systems, Solar Electricity Generating Systems, and Ice Storage Cooling Systems	Exempt	Exempt

Enter	Enter
Not-exempt	Not-exempt
Exempt	Exempt
50% Exempt	50% Exempt

Job Calculation Notes:
Company Overhead and Margin (B) is assumed to be 20% and include jobs related to sales, marketing, management and other overhead jobs
Labor (D) is the percent of the project cost that is used to pay installers, electricians, project managers and engineers
Non-Labor (E) is the percent of the project cost that is used to cover all other project expenses, including materials and non-labor soft costs
Weighted Average Wage (F) is distributed amongst installers, electricians and PM/engineers based on wages in CT as reported by the U.S. Department of Labor as of May 2015
The weight for each job type is based on research and/or interview feedback for employee breakdowns for that field/technology
Total Job-Years Created from Capital Invested (L) is the total number of installer, electrician and PM/engineering jobs created for 1 year

Source: Navigant Consulting, Connecticut Green Bank, DECD.
DECD provided multiplier of 1.3 for indirect and induced jobs.

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CONNECTICUT GREEN BANK

Memo

To: Susan Sherman, Legislative Program Manager. Department of Revenue Services

From: Lucy Charpentier, Manager of Evaluation, Measurement and Verification; Eric Shrago, Director of Operations

Date: March 8, 2018

Re: Connecticut Green Bank/Navigant Consulting Development and use of a Tax Revenue Calculator for Income, Sales and Use Taxes

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BACKGROUND

Founded in 2011, the Connecticut Green Bank is a quasi-public institution that has leveraged its own capital and financing partners to close over 26,000 projects and deploy over $1 Billion dollars into the Connecticut economy in support of cleaner, more efficient energy projects for homes, businesses, and institutions across the state. The benefits from these projects are not just energy related. They have led to the creation of over 14,000 jobs and improved the air quality in state by reducing greenhouse gasses by over 9 million tons that have saved millions of dollars on public health expenditures.

The economic activity sparked by the Green Bank's activities also generates tax revenue for the general fund through personal income taxes paid by those employed in jobs created by these projects, corporate taxes paid on profits earned from these projects and through sales and use taxes generated when these projects are sold. The Green Bank is proposing a methodology for quantifying this tax revenue generation.

ECONOMIC DEVELOPMENT

Economic Development is a positive externality of the Green Bank's programs and activities. Directly, the capital deployed is used to buy the hardware for projects and pay for the labor needed to implement them. Indirectly, this economic activity creates jobs as those in the supply chain increase their operations in response to the implementation of projects. In 2009, the Connecticut Clean Energy Fund (CCEF), the predecessor to the Green Bank, in partnership with the Department of Economic and Community Development (DECD) and the Connecticut Energy Efficiency Fund (CEEF),[1] engaged Navigant Consulting to complete a study to quantify the job years and their wages created because of the support from the CCEF and CEEF activities. This study was refreshed in 2016 by the Connecticut Green

[1] CT Renewable Energy / Energy Efficiency Economy Baseline Study (March 27, 2009)

Bank (Green Bank) in coordination with DECD and with assistance from Eversource Energy and United Illuminating.

The resulting job factors are unique to the combination of project type (technology used) and the Green Bank Program leveraged for the project. The job factors estimate the number of direct and indirect and induced job-years created per $1 million of gross project costs deployed[2] in a given combination of project type and program. More on this can be found here:

- Jobs Fact Sheet
- Job Study

Since inception, the Green Bank has stimulated the creation of more than 16,000 jobs-years[3].

This economic activity also results in revenue for the state in the form of individual income, corporate, and sales taxes. The Green Bank engaged Navigant in 2017 to develop a methodology for estimating this revenue. At present, the Green Bank is reviewing the methodology with the Department of Revenue Services.

INCOME TAX ESTIMATION METHODOLOGY

Building on the Green Bank's Jobs Calculator, the Income Tax Calculator uses the technology specific number of jobs and estimated wages[4] produced by both the 2009 and 2016 Job studies[5]. Then the appropriate effective tax rate is applied based on the tax calculator that can be found on the Department of Revenue Services' website[6] to determine the taxes generated created per $1 million in project costs.

For Corporate Income Taxes, the Green Bank uses the Navigant-developed. This method reviews all parties (installer, lender, investor, etc.) involved in a project, estimates their taxable income from their involvement with the project over its lifetime, and then applies the appropriate standard corporate tax rate. The estimations used for profitability come from an

[2] Note that the Green Bank differentiates between Capital Deployed, Gross Project Cost, and Total Investment. The Capital Deployed and Total Investment metrics include financing costs but might exclude the portion of project costs borne by the building owners. For calculating job-years and taxes, the Green Bank uses Gross Actual project cost as that metric best reflects the cashflows going to lenders and installers.

[3] This number includes job-years created by the Green Bank's requirement of the Energy Efficiency Board's Home Energy Solutions audit for all RSIP program participants which has not previously be included.

[4] Only the 2016 study included wages for indirect and induced job-years. Navigant identified a wage based off of NREL models for 2009 that is consistent with what was done for the 2016 study.

[5] The Green Bank applies the wages and factors from the 2009 study to all projects closed prior to July 1, 2017. The Factors resulting from the 2016 study are applied to all projects closed after June 30, 2017.

[6] For the purposes of this, it is assumed that all job-years created are located in Connecticut and everyone is filing taxes as a single filer.

in-depth analysis prepared by Navigant based on a review of publicly traded companies and qualified CT Green Bank contractors (installers).

SALES AND USE TAX ESTIMATION METHODOLOGY

The Green Bankand Navigant reviewed each technology type to determine the taxable labor and non-labor portions of projects to determine and applied the state sales tax rate of 6.25% to determine the sales and use taxes generated per $1 million of project costs. Both the Green Bank and Navigant have reviewed relevant statutes to determine and apply existing tax exemptions.

RECOMMENDATION

The Green Bank proposes to use above mentioned methodologies as its official tool for measuring Tax Revenues generated and will automate its use where and when possible in our Data Warehouse.

Enc: Tax Calculator

INTEROFFICE MEMORANDUM

TO: BRYAN GARCIA, PRESIDENT AND CEO, CONNECTICUT GREEN BANK

FROM: SCOTT JACKSON, COMMISSIONER, DEPARTMENT OF REVENUE SERVICES

SUBJECT: TAX REVENUE CALCULATOR

DATE: 8/3/2018

CC: SUSAN SHERMAN

Thank you for offering the Department of Revenue Services the opportunity to review and comment upon the Tax Revenue Calculator developed by Navigant Consulting as the official method to assess tax revenue for the State of Connecticut by investments and co-investments mobilized by the Green Bank.

My team and I have carefully reviewed the documents you provided, including your memo of January 24, 2018 and the Tax Revenue Calculator Final Report issued March 28, 2018. It is the analysis of this Agency that the methodology employed by Navigant Consulting represents a fair and reasonable approach to capturing the financial benefits of Green Bank investments derived by the State. The analysis of DRS is confined to the arena of tax revenue; additional accrued community and societal benefits have not been incorporated into our analysis.

The Tax Revenue Calculator accurately reflects contemporary tax types, rates, and exemptions although it is my recommendation that, as long as the calculator is employed, the Green Bank confirm such tax types, rates, and exemptions at the conclusion of any legislative session. Additionally, you may wish to validate with the Connecticut Department of Labor's Office of Research on an annual basis the "Average Direct Wage" identified for the various projects and installations.

In summary, DRS believes that the material provided is focused and illustrative and the estimates provided by the Tax Revenue Calculator are reasonable.

EVALUATION FRAMEWORK ECONOMIC DEVELOPMENT REVENUE GENERATION

CONNECTICUT GREEN BANK

Revenue Generation Impact Overview

Economic Development is a positive externality of the Green Bank's programs and activities. Directly, the capital deployed is used to buy the hardware for projects and pay for the labor needed to implement them. Indirectly, this economic activity creates jobs as those in the supply chain increase their operations in response to the implementation of projects. In 2009, the Connecticut Clean Energy Fund (CCEF), the predecessor to the Green Bank, in partnership with the Department of Economic and Community Development (DECD) and the Connecticut Energy Efficiency Fund (CEEF),[1] engaged Navigant Consulting to complete a study to quantify the job years and their wages created as a result of the support from the CCEF and CEEF activities. This study was refreshed in 2016 by the Connecticut Green Bank (Green Bank) in coordination with DECD and with assistance from Eversource Energy and United Illuminating.

The resulting job factors are unique to the combination of project type (technology used) and the Green Bank Program leveraged for the project. The job factors estimate the number of direct, indirect, and induced job-years created per $1 million of gross project costs deployed[2] in a given combination of project type and program. More on this can be found here:

- Jobs Fact Sheet
- Job Study

Methodology

The Green Bank has long recognized the economic benefits of its investments. Since inception, the Green Bank has stimulated the creation of more than 16,000 jobs-years. This economic activity also results in revenue for the state in the form of individual income, corporate, and sales taxes.

Working with Navigant in 2018, the Green Bank developed a methodology to estimate this revenue. This methodology, which was has been reviewed with the Department of Revenue Services, and is explained on the pages that follow.

1 CT Renewable Energy / Energy Efficiency Economy Baseline Study (March 27, 2009)

2 Note that the Green Bank differentiates between Capital Deployed, Gross Project Cost, and Total Investment. The Capital Deployed and Total Investment metrics include financing costs but might exclude the portion of project costs borne by the building owners. For calculating job-years and taxes, the Green Bank uses Gross Actual project cost as that metric best reflects the cashflows going to lenders and installers.

Methodology

Individual Income Taxes

Personal Income Tax Generated = [Number of job-years created]* x [weighted average wage]** x [income tax rate]***

* Source: 2009 and 2016 Jobs Studies	** Source: 2009 and 2016 Jobs Studies, and NREL JEDI Model	*** Source: Department of Revenue Services Tax Calculator

The Green Bank uses the methodology developed by Navigant to estimate individual income taxes. This method relies on the factors for job creation and estimated wages[3] produced by both the 2009 and 2016 Job studies.[4] Then the appropriate effective tax rate is applied based on the tax calculator that can be found on the Department of Revenue Services' website.[5]

To operationalize this, the Green Bank has created individual income tax factors that too are a result of the combination of project type (technology used) and the Green Bank Program leveraged for the project, and estimate the taxes paid per $1 million invested.

By applying this methodology[6], for example, to the $1.2 billion of costs of projects sparked by the Green Bank since its inception, the Green Bank estimates its activities have generated $30.1 million in individual income tax revenues for the General Fund.

Corporate Income Taxes

Corporate Income Tax Generated = [Sum of taxable income]* x [corporate income tax rate]**

* Source: 2018 Tax Calculator models of corporate profitability	** Source: CT Department of Revenue Services

The Green Bank uses the Navigant-developed method for estimating corporate income taxes. The method reviews all parties (installer, lender, investor, etc.) involved in a project, estimates their taxable income from their involvement with the project over its lifetime, and then applies the appropriate standard corporate tax rate. The estimations used for profitability come from an in-depth analysis prepared by Navigant based on a review of publicly traded companies and qualified CT Green Bank contractors (installers).

To operationalize this, the Green Bank has created corporate income tax factors that too are a result of the combination of project type (technology used) and the Green Bank Program leveraged for the project and estimate the taxes paid per $1 million invested.

By applying this methodology[7], for example, to the $1.2 billion of costs of projects sparked by the Green Bank since its inception, the Green Bank estimates its activities have generated $13.9 million in corporate income tax revenues for the General Fund.

3 Only the 2016 study included wages for indirect and induced job-years. Navigant identified a wage based off of NREL models for 2009 that is consistent with what was done for the 2016 study.

4 The Green Bank applies the wages and factors from the 2009 study to all projects closed prior to July 1, 2017. The Factors resulting from the 2016 study are applied to all projects closed after June 30, 2017.

5 For the purposes of this, it is assumed that all job-years created are located in Connecticut and everyone is filing taxes as a single filer.

6 This methodology has been presented to the CT Department of Revenue Services in January 2018. We expect to further review it with them in March 2018 and for it to be approved by the Green Bank Board of Directors subsequently.

7 This methodology has been presented to the CT Department of Revenue Services in January 2018. We expect to further review it with them in March 2018 and for it to be approved by the Green Bank Board of Directors subsequently

Sales Tax

The Green Bank's programs also generate revenue for the state through sales and use tax. While solar thermal, solar photovoltaic, and geothermal generation equipment and activities (home installation work) are exempt from sales tax, the rest of the activities to sell and install the Green Bank's projects contribute to the general fund.

Sales Tax Generated = [Gross Project Cost]* x [% of Project that is a taxable Service or Hardware]** x [6.35%]***

*** Source: CT Green Bank Data Warehouse**

**** Source: 2018 Navigant Tax Calculator**

***** Source: CT Department of Revenue Services**

As part of their 2018 analysis, Navigant identified what portion of a project's costs are from labor and what are from hardware. They also broke down the labor portion into what is engineering or design work and what is pure installation work as this distinction impacts whether or not the contracted labor is taxable. Applying the state's 6.35% sales tax rate to the taxable projects (i.e. excluding solar PV, solar thermal, and geothermal projects which are exempt from sales taxes) or portions of projects, the Green Bank estimates that projects stimulated by its programs have generated $13.6 million in sales taxes for the state since inception.[8]

Overall

Across all of its projects, for FY 2012 through FY 2017, the Green Bank's activities have generated an estimated $57.6 million for the state.

Table 1.

Sum of ActualGrossCost	FYClosed						
Market	2012	2013	2014	2015	2016	2017	Grand Total
Capital Deployed	$38,822,491	$118,871,396	$105,012,856	$317,404,490	$301,155,574	$194,278,615	$1,075,545,420
Capital Deployed - Labor	$17,287,081	$46,004,645	$37,643,116	$115,720,947	$107,259,752	$72,831,750	$396,747,291
Capital Deployed - Hardware	$21,535,410	$72,866,751	$67,369,740	$201,683,542	$193,895,822	$121,446,864	$678,798,129
Direct Jobs Created	259	636	635	1,859	1,880	806	6,075
Indirect and Induced Jobs Created	416	1,021	1,020	2,890	3,013	413	8,773
Total Jobs Created	675	1,656	1,656	4,749	4,892	1,219	14,848
Individual Income Taxes Generated	$1,293,428	$3,186,490	$3,012,139	$9,378,468	$8,891,072	$4,308,682	$30,070,278
Corporate Taxes Generated	$729,841	$1,146,201	$1,654,528	$4,359,442	$3,579,538	$2,479,796	$13,949,345
Sales Taxes Generated	$182,457	$4,165,296	$856,421	$4,016,435	$2,291,750	$2,079,636	$13,591,996
Total Taxes Generated	$2,205,725	$8,497,987	$5,523,088	$17,754,345	$14,762,360	$8,868,114	$57,611,618

8 Methodology was reviewed by the CT Department of Revenue Services in March 2018 and approved by the Green Bank Board of Directors subsequently..

continued >

About the Connecticut Green Bank

The Connecticut Green Bank was established by the Connecticut General Assembly on July 1, 2011 as a part of Public Act 11-80. As the nation's first full-scale green bank, it is leading the clean energy finance movement by leveraging public and private funds to scale-up renewable energy deployment and energy efficiency projects across Connecticut. The Green Bank's success in accelerating private investment in clean energy is helping Connecticut create jobs, increase economic prosperity, promote energy security and address climate change. In 2017, the Connecticut Green Bank received the Innovations in American Government Award from the Harvard Kennedy School Ash Center for Democratic Governance and innovation for their "Sparking the Green Bank Movement" entry. For more information about the Connecticut Green Bank, please visit www.ctgreenbank.com.

About the Department of Revenue Services

The Connecticut Department of Revenue Services is responsible for instilling public trust in the collection of and increasing the voluntary compliance with taxes in the state. To learn more about DRS, please visit http://www.ct.gov/drs/site/default.asp.

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CONNECTICUT GREEN BANK

Memo

To: Members of the Connecticut Green Bank (the "Green Bank")) Audit Committee

From: George Bellas

CC: Bryan Garcia, Brian Farnen, Bert Hunter, Eric Shrago

Date: October 10, 2018

Re: Results of annual financial audit of the Green Bank and the Green Bank 2017 draft CAFR and Federal Single Audit Report

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Dear Committee members:

Results of Annual Financial Audit:

Blum Shapiro and Company performed the annual financial audit of the Green Bank for the fiscal year ending June 30, 2018. They will be presenting the results of their audit to the Committee during the meeting. The audit itself went well with no material internal control weaknesses identified or material adjustments to the financial books and records recorded.

Green Bank 2018 draft CAFR:

I am enclosing the draft Green Bank 2018 CAFR for your review. The major sections of the CAFR are as follows:

1. Financial Audit Section

2. Statistical Section

Financial Section:

This section contains Management's Discussion and Analysis of the results of operations for the current and prior fiscal years as well as the audited financial statements and related footnotes.

The financial statements themselves, comprised of the Statement of Net Position, the Statement of Revenues, Expenses and Changes in Net Position and the Statement of Cash Flows have been completed. The related footnotes have also been completed.

Staff has reviewed the draft and provided Blum Shapiro with a list of adjustments that need to be made before finalizing the draft. These edits include general clean-up for

typos and grammar and minor reclassifications of amounts presented in the financial statements and footnotes. The finalized draft will be presented to the full Board based on your recommendation for approval. We do not anticipate any further adjustments to the financial statements themselves which would have a material impact on the financial position of the Green Bank.

Statistical Section

The statistical section is broken out into two subsections:

Financial Statistics:

Financial Statistics are organized in tables as follows:

- Net Position by Component
- Changes in Net Position
- Operating Revenue by Source
- Significant Sources of Operating Revenue
- Outstanding Debt by Type
- Demographic and Economic Information
- Principal Employers for the State of Connecticut
- FTE's by Function
- Operating Indicators by Function
- Capital Assets Statistics by Function

Minor edits to the data in these tables are anticipated.

Non-Financial Statistics:

The non-financial statistical section contains statistical data and narrative pertaining to the Green Bank's current programs. There is a table of contents in the front of this section for the reader's use. We have included a report on the non-financial metrics from Sustainability, an independent external reviewer. This report strictly pertains to the non-financial metrics included in this section of the CAFR.

Federal Single Audit Report

The Federal Single Audit Report is required to be issued in conjunction with a Federal grantee's issuance of the financial audit if certain thresholds are meet during the fiscal year pertaining to the disbursement of federal funds. During fiscal year 2018 the Green Bank met the threshold for reporting disbursements made under Federal ARRA and

Department of Energy grants. The report contains a schedule of disbursements made for each federal grant received. No exceptions or adjustments were necessary based on this audit.

In conclusion I wish to thank the committee members for their effort in reviewing this document. Our goal is to provide readers with a comprehensive overview of the financial and programmatic activities of the Green Bank on an annual basis.

RESOLUTION:

WHEREAS, Article V, Section 5.3.1(ii) of the Connecticut Green Bank ("Green Bank") Operating Procedures requires the Audit, Compliance, and the Governance Committee (the "Committee") to meet with the auditors to review the annual audit and formulation of an appropriate report and recommendations to the Board of Directors of the Green Bank (the "Board") with respect to the approval of the audit report;

NOW, therefore be it:

RESOLVED, that the Committee hereby recommends to the Board of Directors for approval the proposed draft Comprehensive Annual Financial Report (CAFR) for 2018 and with the associated Federal Single Audit Report contingent upon no further adjustments to the financial statements or additional required disclosures which would materially change the financial position of the Green Bank as presented.

CONNECTICUT GREEN BANK SM

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