

TRC for the Rest of Us

Breaking Down Cost-Effectiveness

10th Annual Statewide Energy Efficiency Forum
June 26, 2019



Learning Together



Moderator:

Nicol Manzanares

Program Manager
The Energy Coalition



Perspectives

Chris Ford

Project Manager

The Energy Coalition, on behalf of
the Southern California Regional
Energy Network (SoCalREN)



Lou Jacobsen

Director of Demand Side

Management

Redwood Coast Energy Authority



Lara Ettenson

Director, Energy Efficiency Initiative

Natural Resources Defense Council



What We're Discussing

1. Unpacking the equation -- What are the inputs that impact TRC and what program design elements have the largest impact?
2. How CPUC cost-effectiveness policy has impacted successful energy efficiency programs?
3. Why are certain programs refunded while others don't make the cut?
4. How do non-resource programs serve to improve the performance of energy efficiency resource programs?
5. What are some other options to measure cost-effectiveness?

What is “Cost-Effective?”

$$\frac{\text{Benefits}}{\text{Costs}} \geq 1$$

What counts as a “*Benefit*”?

What counts as a “*Cost*”?

Who is receiving the costs & benefits?

TRC = Total Resource Cost Test

Who is considered in the TRC Equation?



Participant/Ratepayer



Utility



Program Administrator



Society

What is Total Resource Cost and Why does it matter?

TRC Background and Structure

Chris Ford

Project Manager | The Energy Coalition

Southern California REGIONAL ENERGY NETWORK



The Southern California Regional Energy Network (SoCalREN) was created to harness the collective power of residents, businesses and the public sector to achieve an unprecedented level of energy savings across Southern California.



Residential



Multifamily



Financing



Public Agencies



The SoCalREN Public Agency Programs are administered by the County of Los Angeles and funded by California utility ratepayers under the auspices of the California Public Utilities Commission. Learn more at socalren.org.



130
Agency
Enrollments

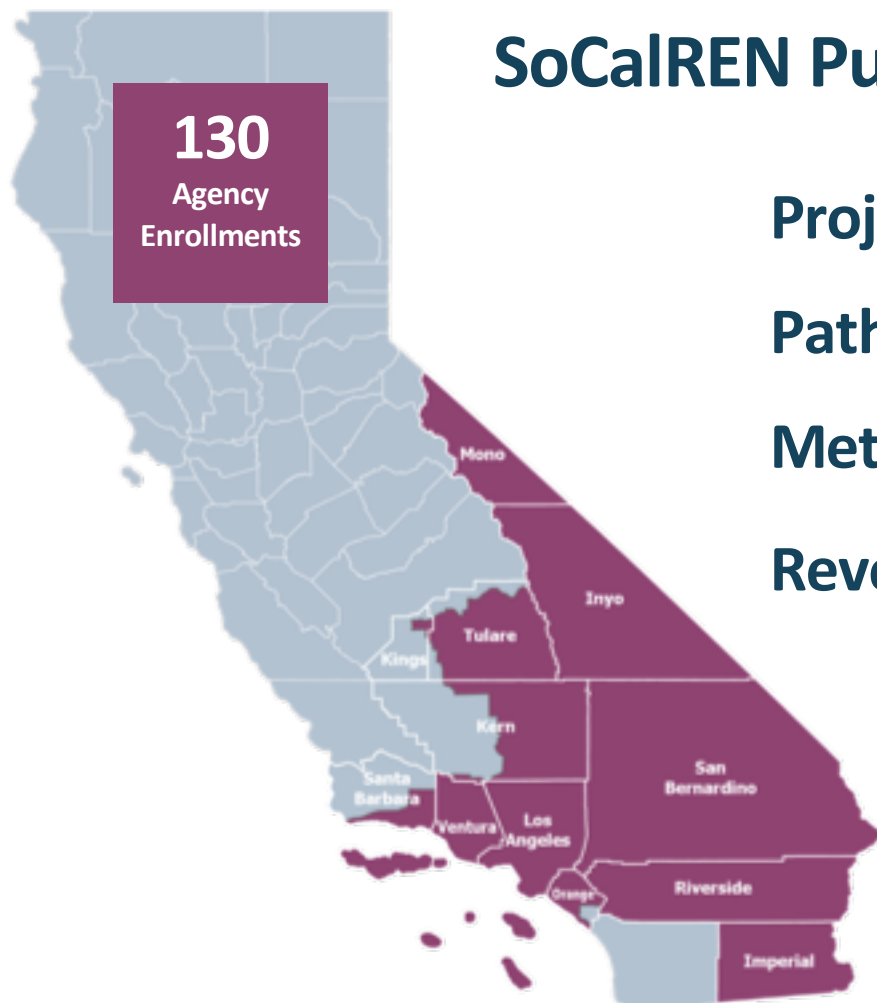
SoCalREN Public Agency Programs

Project Delivery Program

Pathway to Zero

Metered Savings Program

Revolving Loan Fund



Overview: Energy Efficiency Cost Effectiveness

1. How is cost-effectiveness measured?
2. What is Total Resource Cost?
3. How is avoided cost determined?
4. Is TRC for everyone?

How is Cost-Effectiveness Measured?

Test	Question Answered
Total Resource Cost (TRC)	Will the sum of the utility's total costs and the participant's total costs decrease?
Participant Cost Test (PCT)	Will costs decrease for program participants ?
Ratepayer Impact Measure (RIM)	Will utility rates decrease?
Program Administrator Cost Test (PAC)	Will the program administrator's total costs decrease?
Societal Cost Test (SCT)	Will total costs to society decrease?

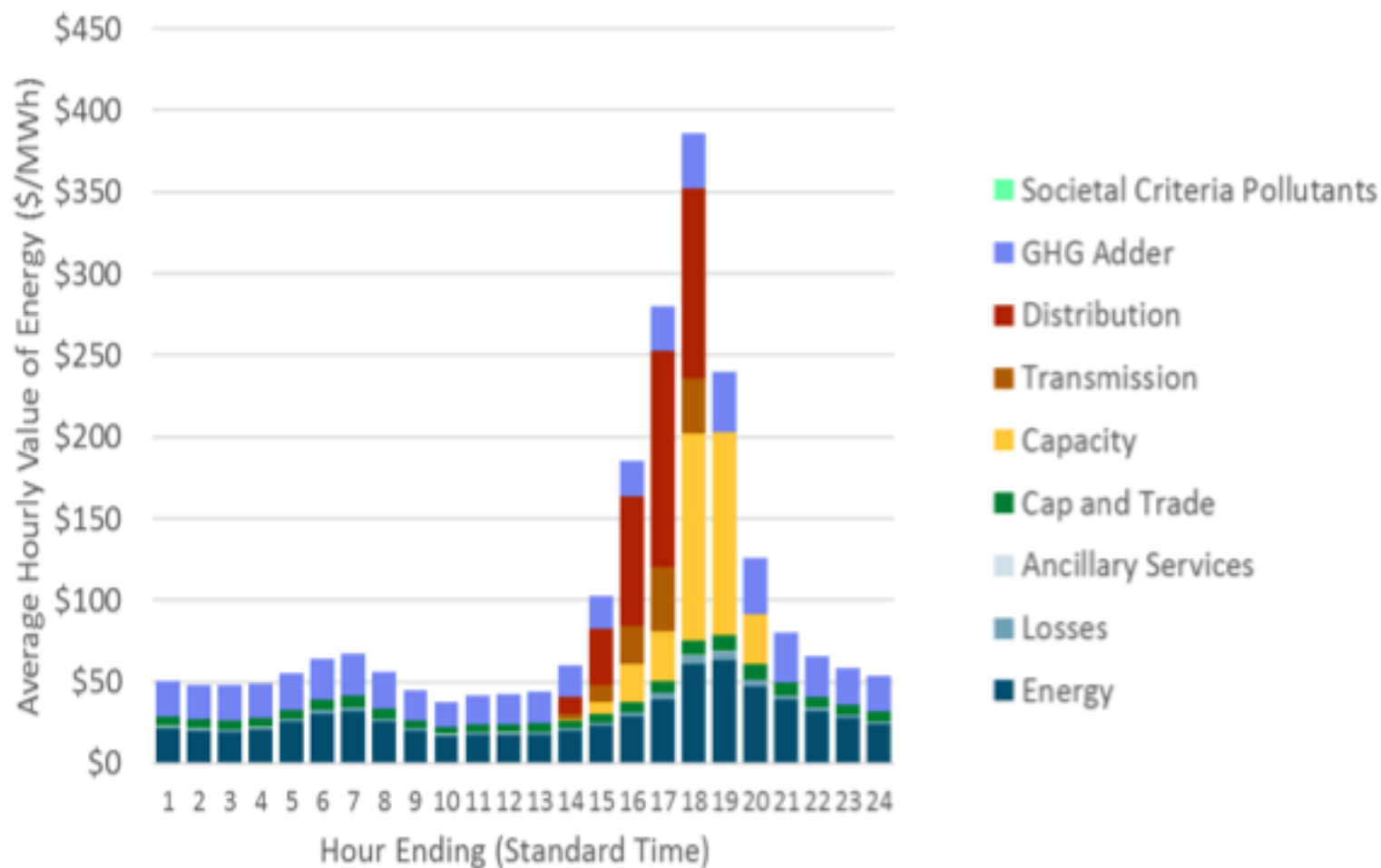
What is Total Resource Cost?

$$\text{TRC} = \frac{\text{Benefits}}{\text{Costs}} = \frac{\text{Avoided Costs}}{\text{Measure/Program Costs}}$$

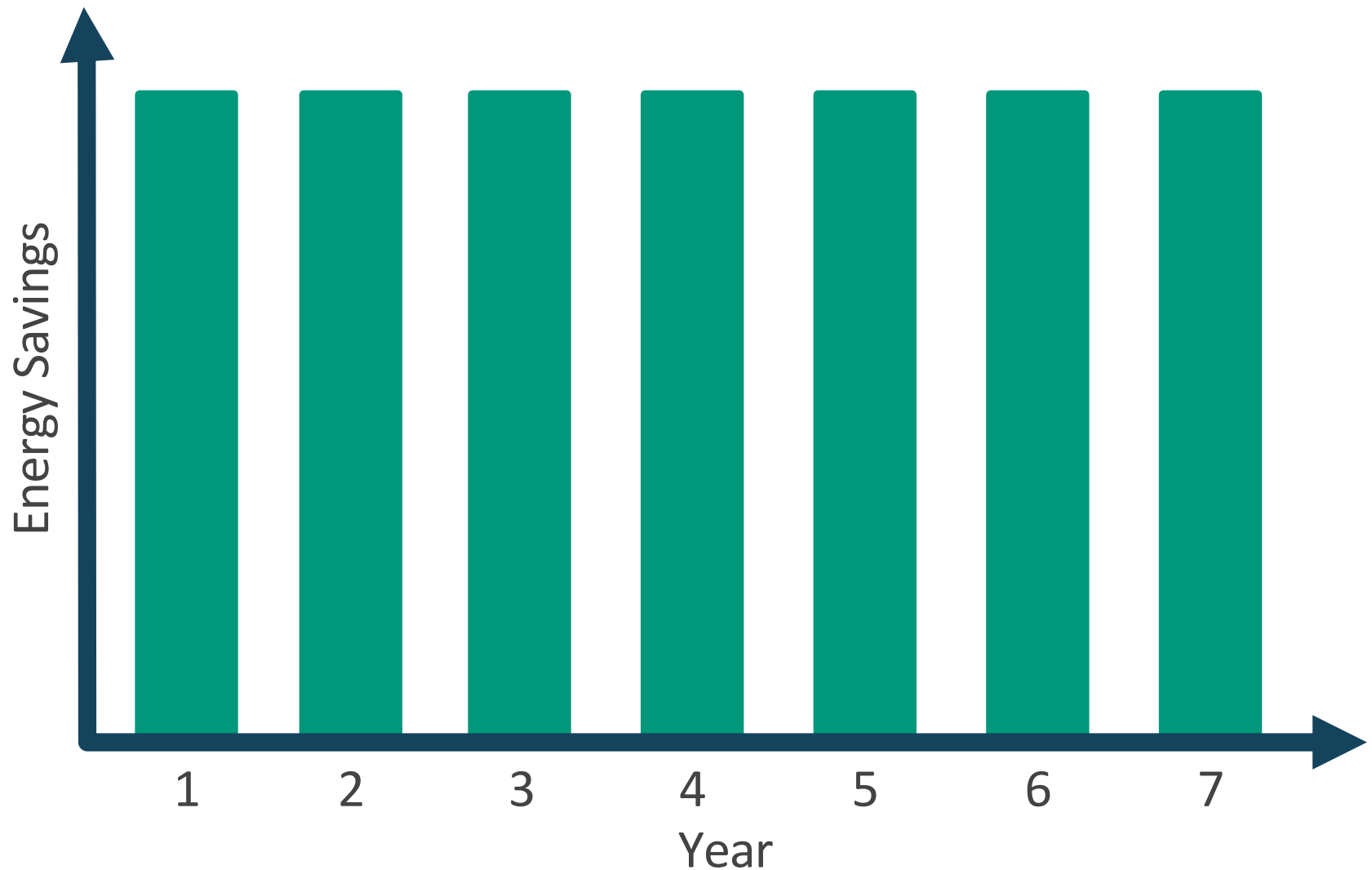
How are Avoided Costs Determined?

Input	Definition
Cost Factors	Costs avoided by the utility due to reduced energy consumption/demand
Energy Savings (kWh/therms)	Utility-recognized measure savings
Effective Useful Life (EUL)	Useful life of the measure installed
Discount Rate (%)	Accounts for time value of money
Gross Realization Rate (GRR)	Accounts for potential overestimation of savings
Net-to-Gross Ratio (NTG)	Accounts for “free riders” in the program

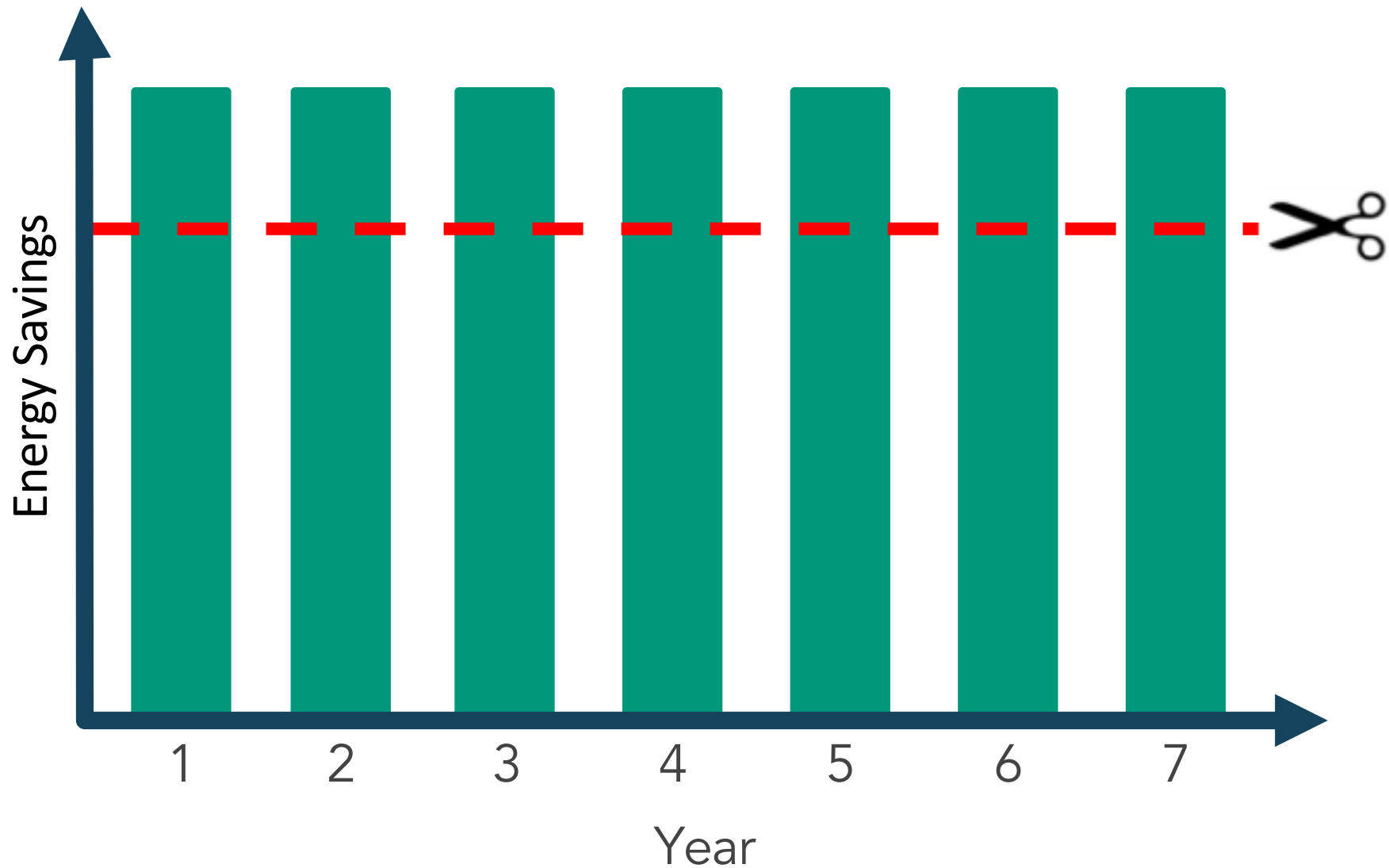
Avoided Cost - Cost Factors



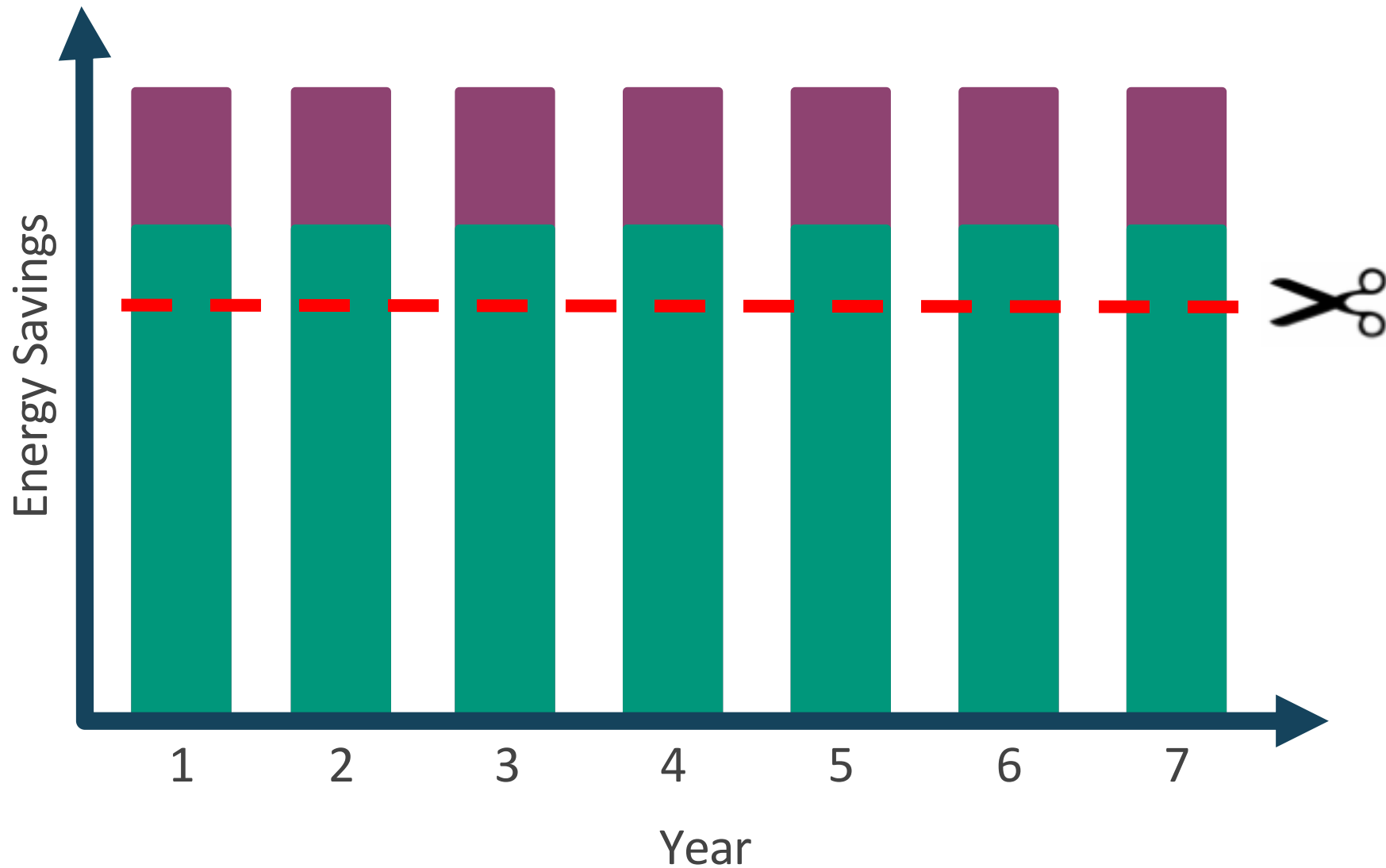
Moving from Gross to Net Savings



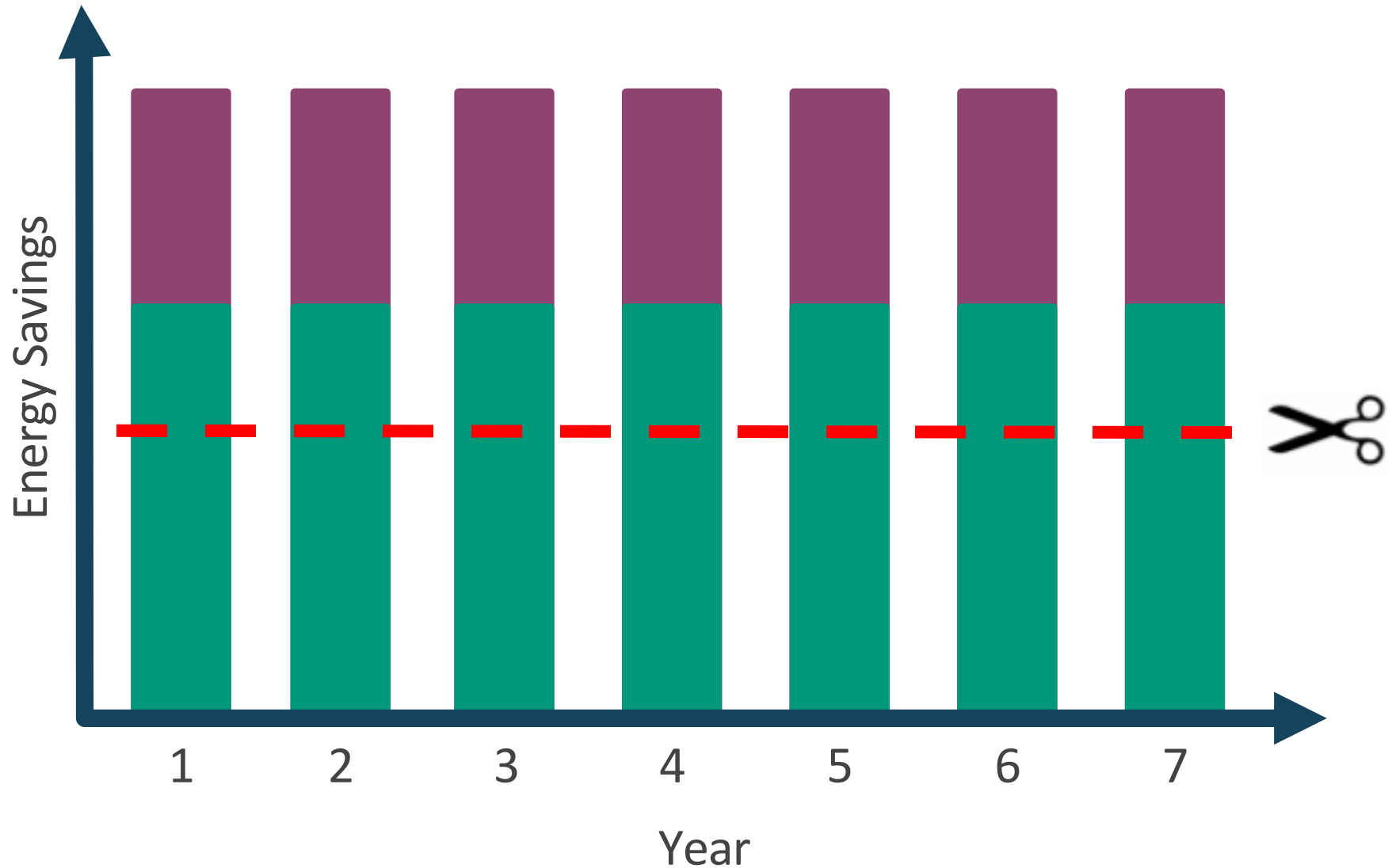
Apply baseline impacts



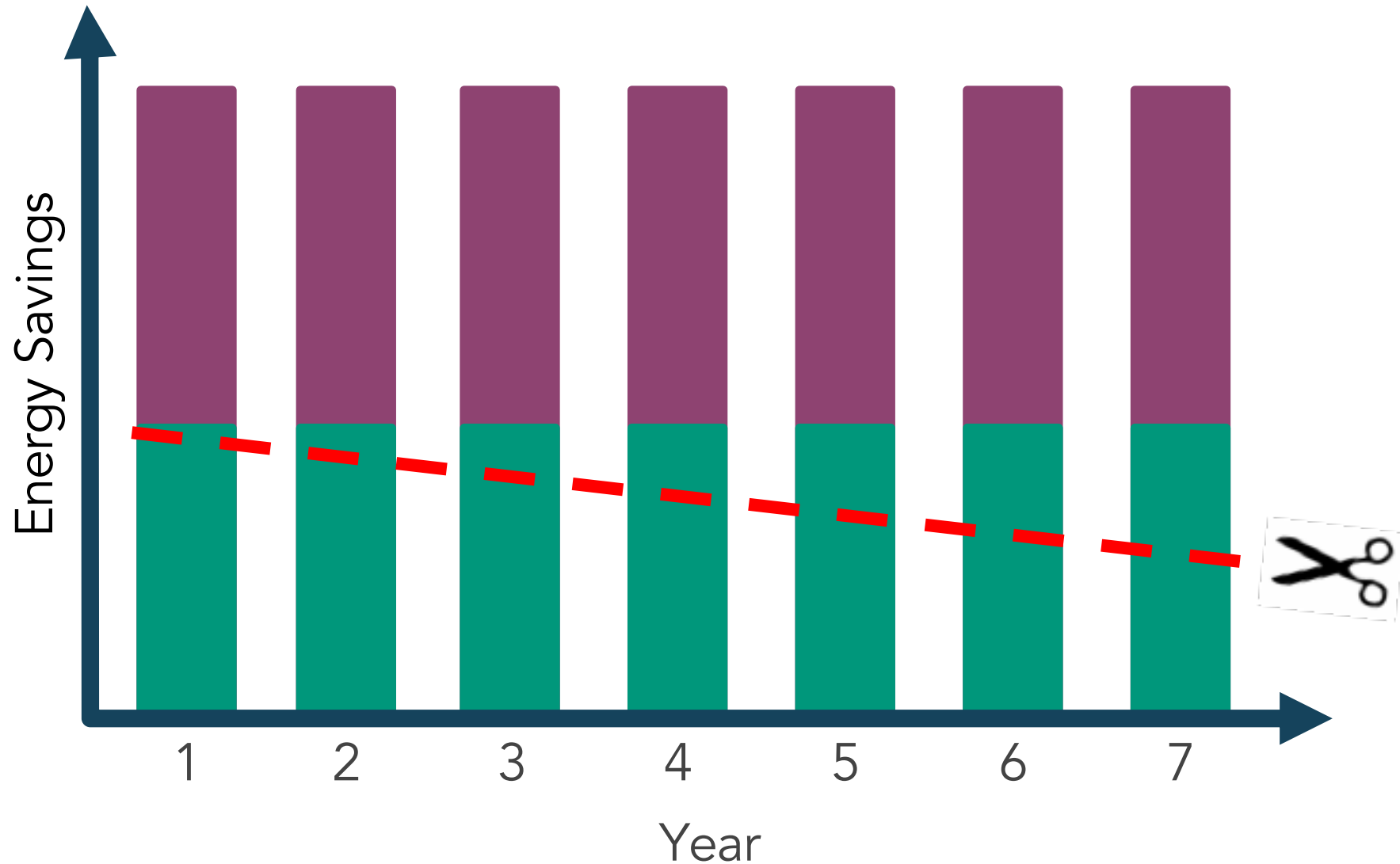
Apply Gross Realization Rate



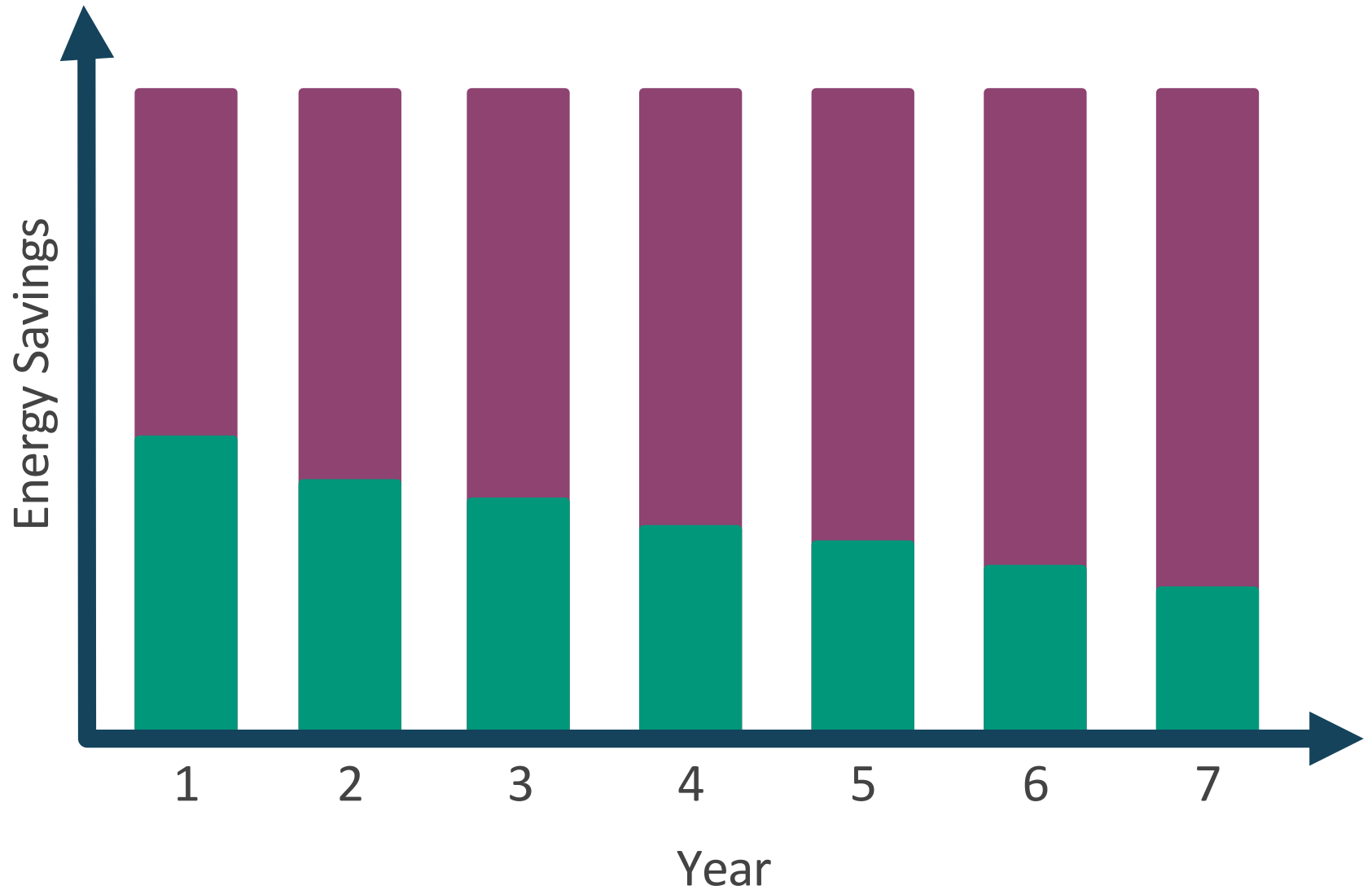
Apply Net-to-Gross



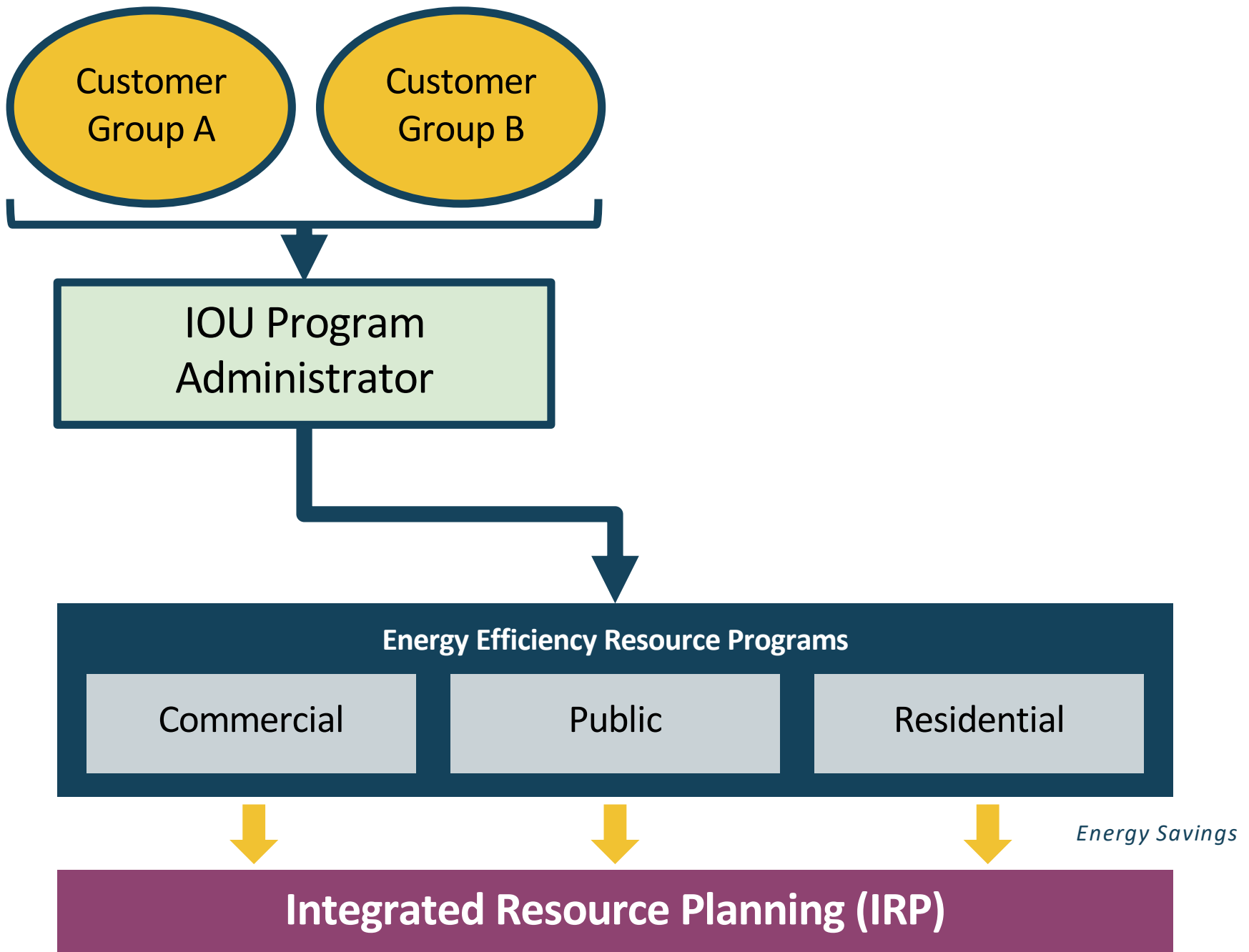
Apply Discount Rate

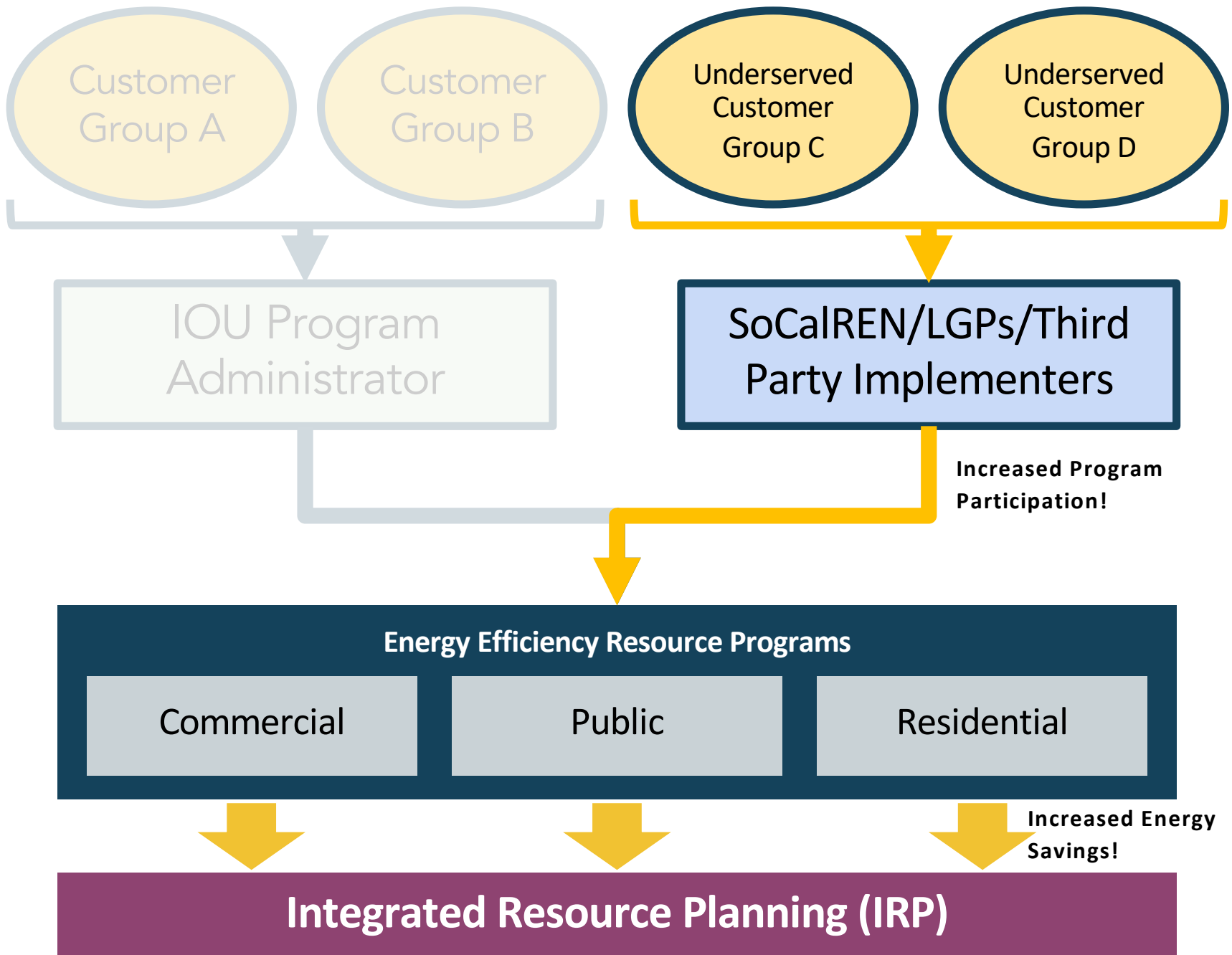


Net Savings Claimed



Should *every* EE program be
evaluated using TRC?







Lou Jacobson

Director of Demand Side Management | RCEA



REDWOOD COAST
EnergyAuthority



REDWOOD COAST
Energy Authority



I See only as Far as the Bend in the River



But Imagine a Place where our Streams Intersect

Source: Unidentified Trinity County river rat—date accessed sometime years ago on the river



2019 Statewide CEDARS Filings By Sector

(excludes CCAs, RENs and Codes & Standards)

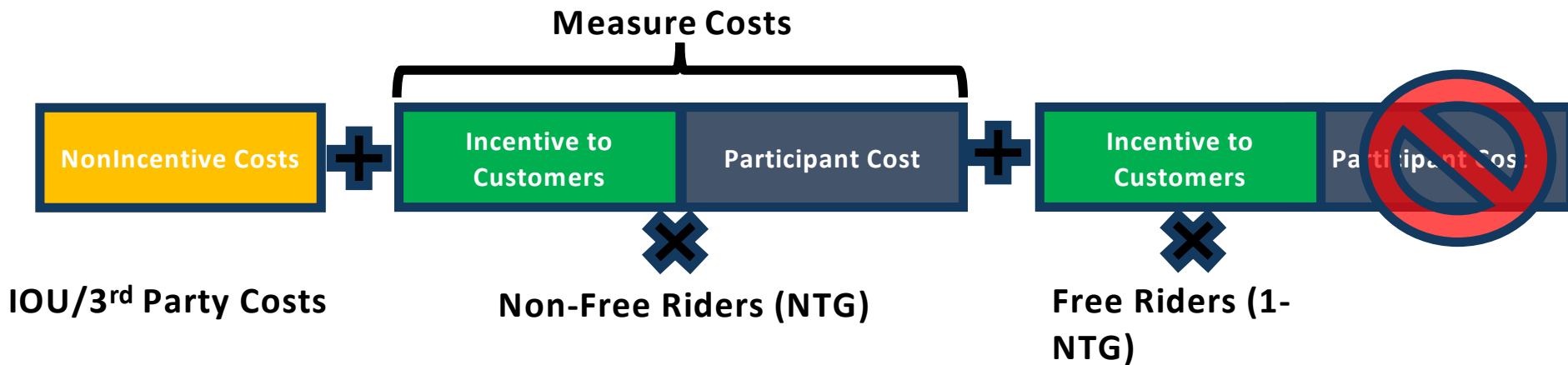
Primary Sector	TRC	PAC
► Portfolio (all Sectors)	1.15	1.59
► Residential	1.53	2.00
► Public	0.51	0.57
► Industrial	1.32	1.97
► Cross-Cutting	0.85	1.19
► Commercial	1.06	1.60
► Agricultural	0.90	1.54

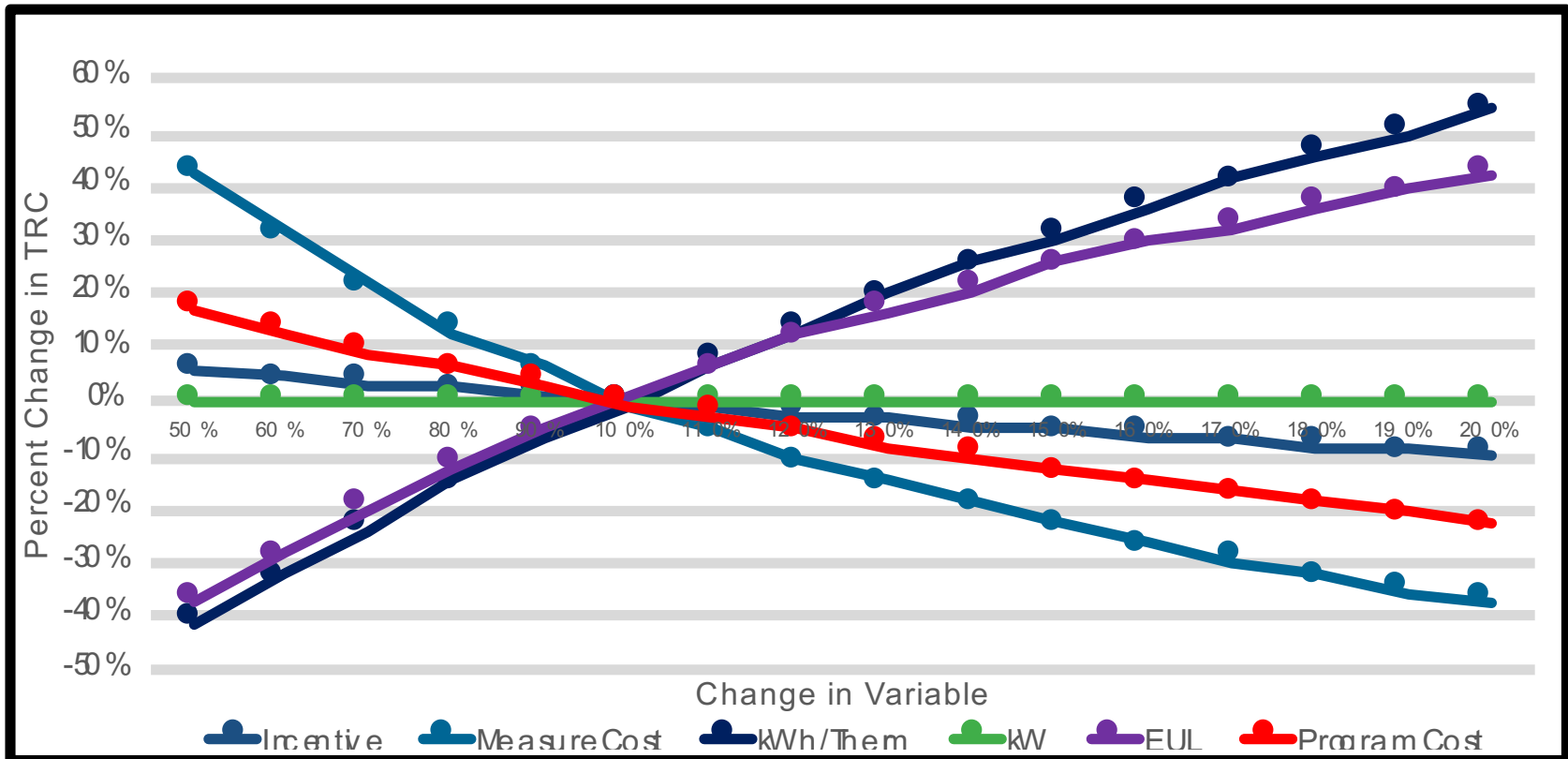
Date Accessed June 14th 2019

https://cedars.sound-data.com/filings/list/2019/?include_c_n_s=false&include_cca_rens=false



$$\text{TRC} = \frac{(\text{Avoided Cost Benefits}) \times \text{NTG}}{(\text{NonIncentive Costs}) + (\text{Measure Costs}) \times \text{NTG} + (\text{Incentives}) \times (1 - \text{NTG})} = \frac{\text{TRC Benefits}}{\text{TRC Costs}}$$

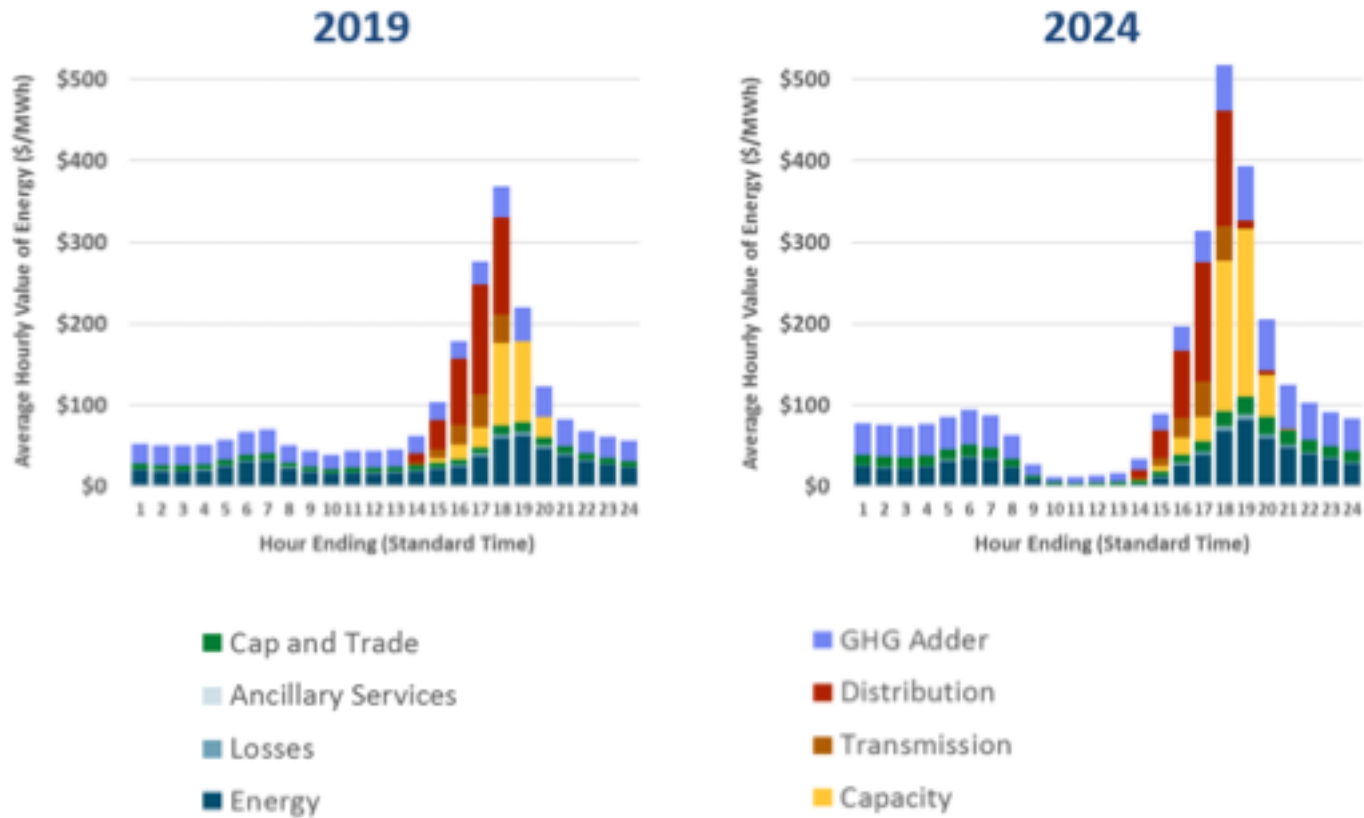




- Portfolio TRC is most sensitive to measure costs and kWh/therm savings.
- kW does not impact the calculation of TRC.

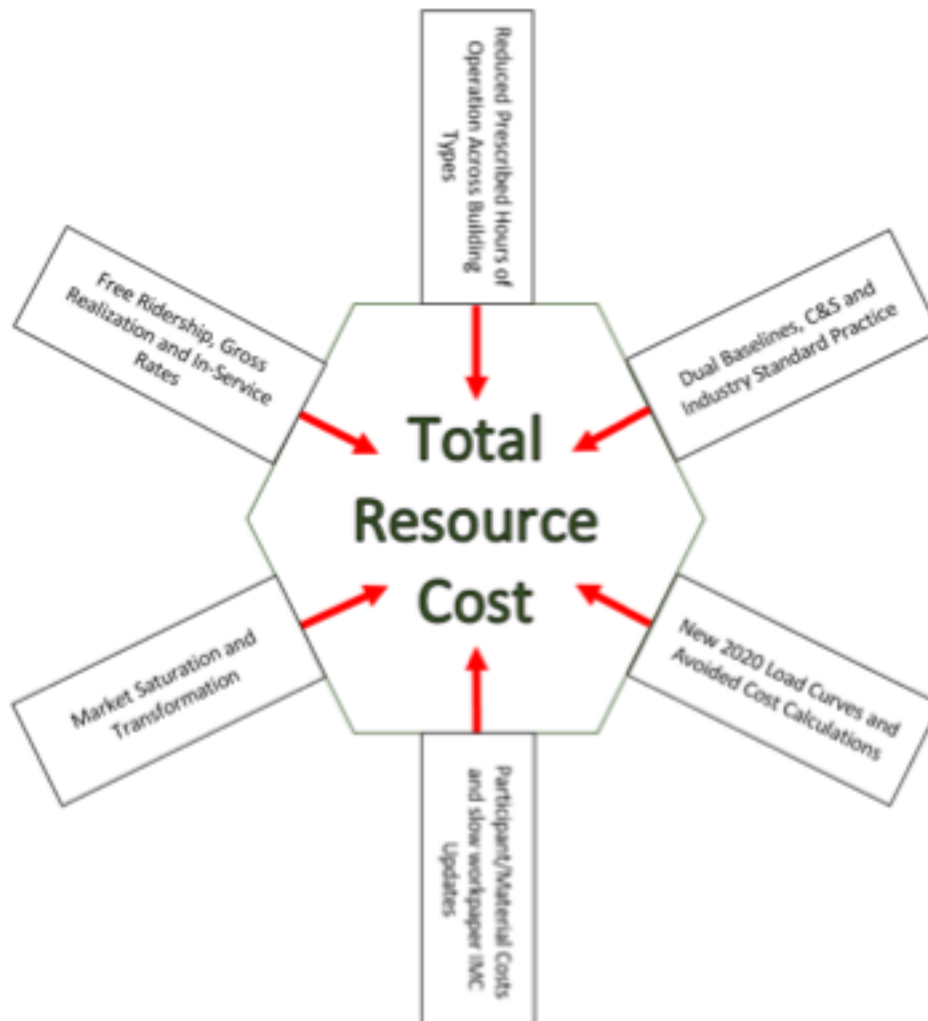


Avoided Costs



CZ4 shown; ftp://ftp.cpuc.ca.gov/gopher-data/energy_division/EnergyEfficiency/CostEffectiveness/ACC_2018_v1f.xlsb

Source: January 7th 2019 Joint Investor Owned Utility presentation on Cost-Effectiveness PowerPoint slide 5



- **Avoided Costs**
 - Duck Curve impacts
 - New DEER load curves
 - DEER hours of operation
 - Dual baselines / C&S / ISP
 - Effective Useful Life
 - Net realized energy savings
- **Participant/Measure Costs**
 - Actual measure costs
 - Public procurement
 - Incremental measure costs
 - Incentives paid to free riders
- **Administrative Costs**
- **Diffusion S-Curve and Market Adoption rates**



Resource Acquisition Impacts

$$\text{TRC} = \frac{(\text{Avoided Cost Benefits}) \times \text{NTG}}{(\text{NonIncentive Costs}) + (\text{Measure Costs}) \times \text{NTG} + (\text{Incentives}) \times (1 - \text{NTG})} = \frac{\text{TRC Benefits}}{\text{TRC Costs}}$$

- A focus on increasing the numerator
- A focus on reducing the denominator
- Service impacts to non-HTR
- Service impacts in the Hard to Reach setting



EQUALITY



EQUITY

Energy Efficiency Policy



Lara Ettenson

Director, Energy Efficiency Initiative | NRDC

Achieving High Energy Savings



Courtesy: Regulatory Assistance Project. "The Next Quantum Leap in Efficiency: 30 Percent Electric Savings in Ten Years," January 26, 2016. See [here](#) for the report and [here](#) for the webinar.

National Standard Practice Manual

Principle	Question to Assess
Efficiency as a resource	<i>Does the test compare efficiency consistently with other resources (e.g., same type of costs)?</i>
Policy goals	<i>Does the test account for how best to achieve policy goals (e.g., CPUC orders and state law)?</i>
Hard-to-quantify impacts	<i>Are all relevant impacts included either using best available data, proxies, or other method?</i>
Symmetry	<i>For each type of cost is there a related benefit?</i>
Forward-looking analysis	<i>Does the test include only future, incremental costs?</i>
Transparency	<i>Is it easy for anyone to understand the test and what was included in the analysis?</i>

Courtesy: Tim Woolf, Synapse. "Benefit-Cost Analysis For Investments in the Modern Grid," July 16, 2018. See [here](#) for the report presentation. See [here](#) for the NSPM website.

Where To Next?



Photo by [Gregory Culmer](#) on [Unsplash](#)



Photo by [Alex Holyoake](#) on [Unsplash](#)



Photo by [Kelly Neil](#) on [Unsplash](#)



Homework Assignment

1. Strike up a chat about cost-effectiveness tonight
1. Bookmark tomorrow's session: *"The Spirit of Free Ridership Policy and the Public Sector"*

1:30 - 2:45 pm | Salon C

Thank You!

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