

# Energy Efficiency Valuation:

## Boogie Men, Time Warps, and other Terrifying Pitfalls

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# A Sobering Assessment

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Energy efficiency is systematically, dramatically and pervasively undervalued in many ways.

Consequently:

- Efficiency appears much less cost-effective than it is.
- Many key stakeholders see efficiency as bad for customers.
- After 20 – 30 years, many states are only scratching the surface of the potential for energy efficiency.

# Regulatory Mindset On Efficiency

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Originally, efficiency advocates argued:

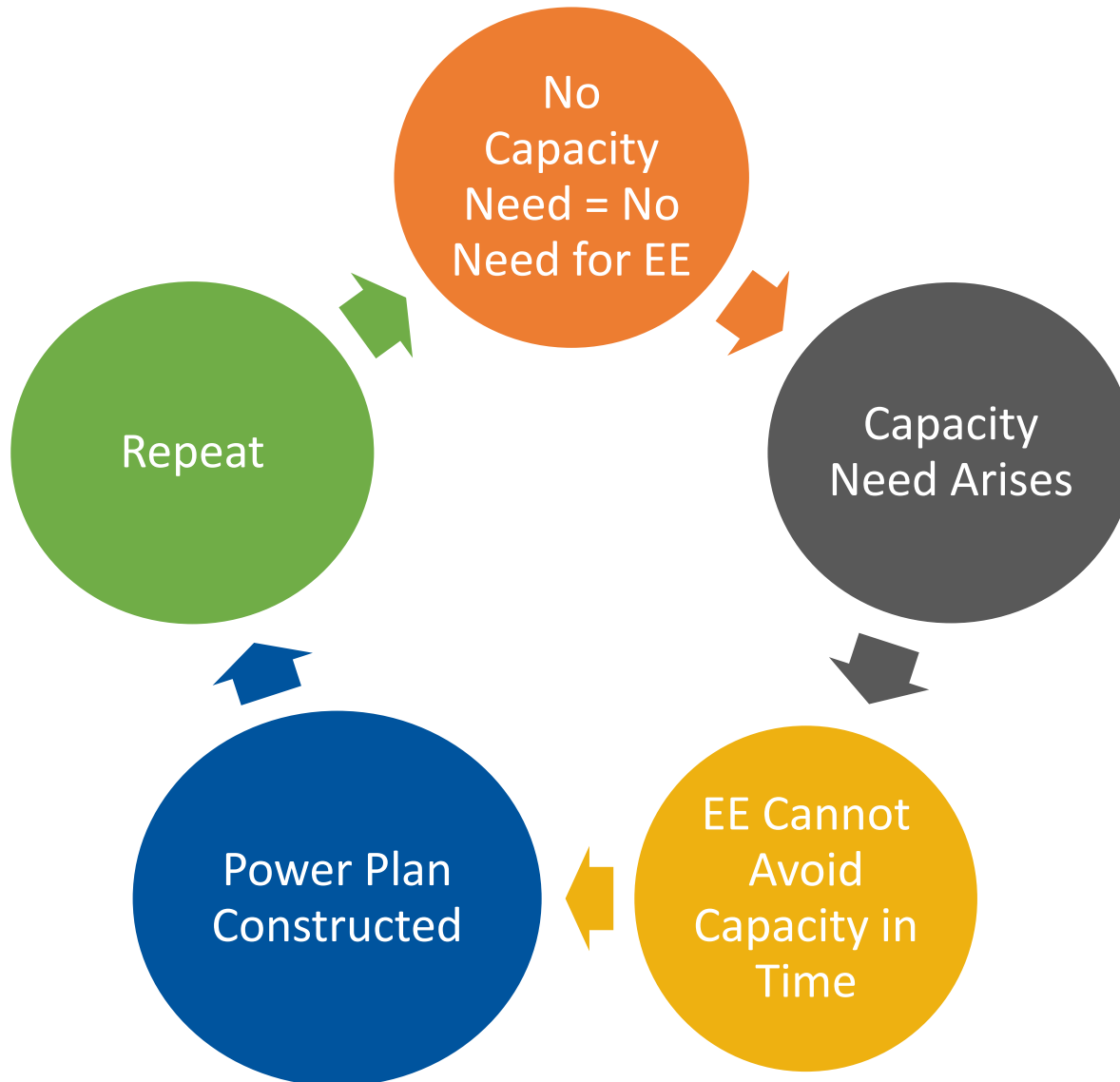
- Utilities must implement efficiency, because it is so cost-effective.

However, that logic has been used against EE:

- Utilities cannot implement efficiency unless it is cost-effective.

Real progress on EE will require reversing this mindset.

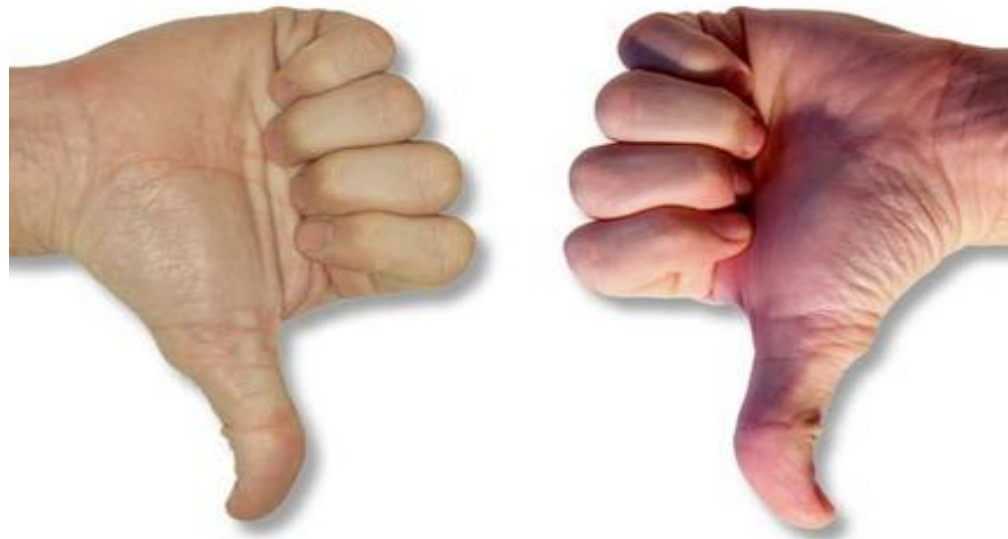
# The Cycle of Denial



# Heads I Win, Tails You Lose

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- When prices (and avoided costs) are low, energy efficiency is considered much less cost-effective.
- When prices (and avoided costs) are high, regulators and others do not want to increase EE because rates are already too high.
- Either way, efficiency is undervalued.



# Show Me the Money

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Many states have energy policy goals supporting EE.

Examples:

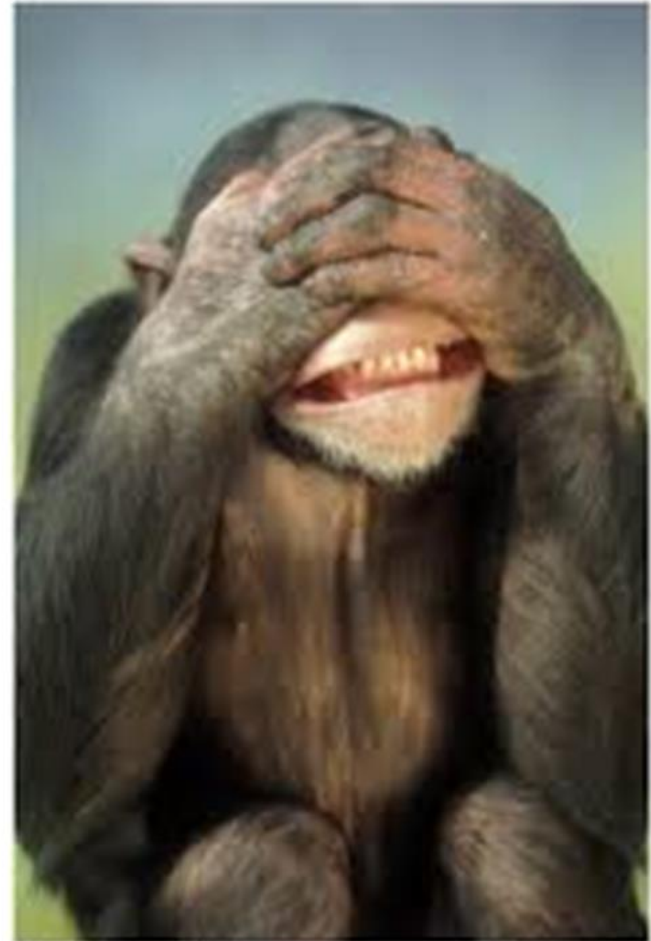
- Reduce electricity and gas bills.
- Assist low-income customers with high energy burdens.
- Promote customer equity.
- Increase the reliability of electricity and gas systems.
- Reduce the risks associated with electricity and gas systems.
- Reduce the consumption of fossil fuels, or imported fuels.
- Reduce environmental impacts. Address climate change.

These goals are often in statutes and regulations.

But some states ignore these goals because they do not easily translate into dollars.

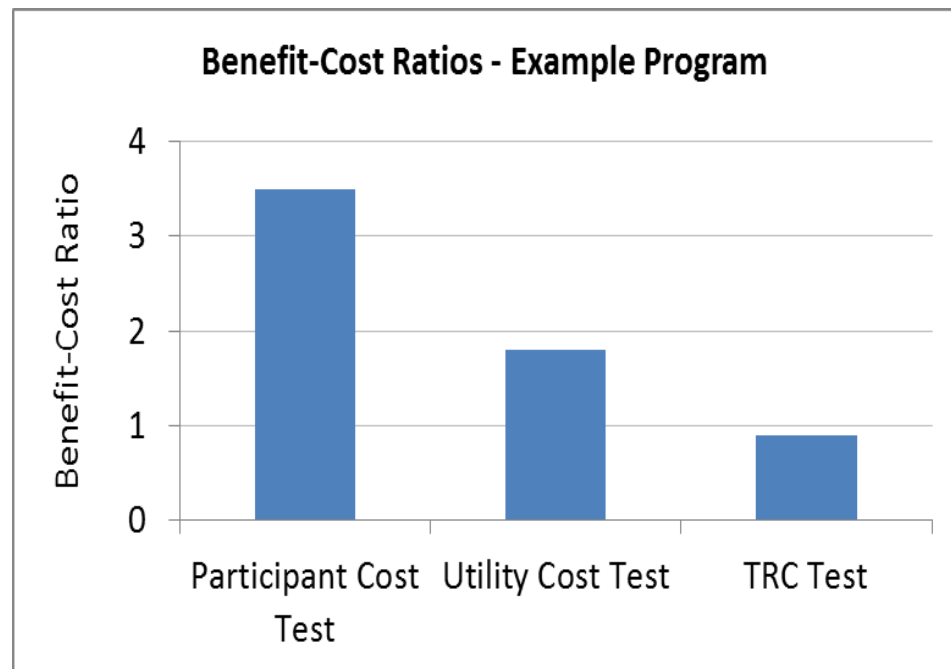
# If I Can't Count it, it Doesn't Exist

- Many benefits are often not accounted for because they are uncertain or hard to quantify.
- Non-Energy Benefits:
  - Utility
  - Participants
  - Society
- But costs are easy to quantify, so they are accounted for.
- EE looks much worse than it really is.



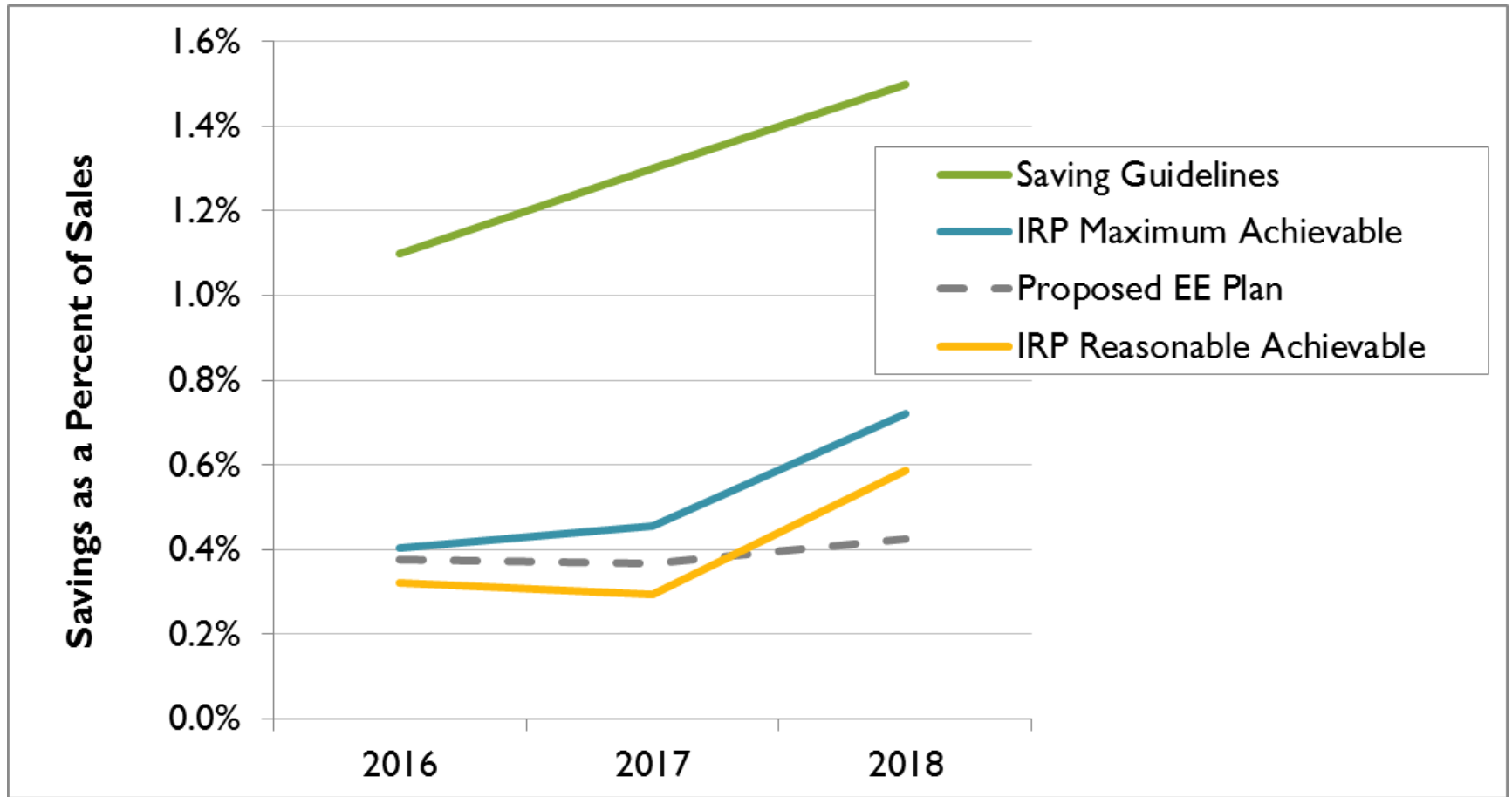
# The Mix and Match

- The Total Resource Cost test supposedly indicates the impacts on all customers, including the participants.
- However:
  - Participant benefits = avoided prices
  - Utility benefits = avoided costs
  - Therefore the TRC test does not indicate impacts on participants
  - The TRC test is really the Societal Cost test without the societal benefits
- The participants always benefit.
- Energy efficiency looks much worse than it really is.



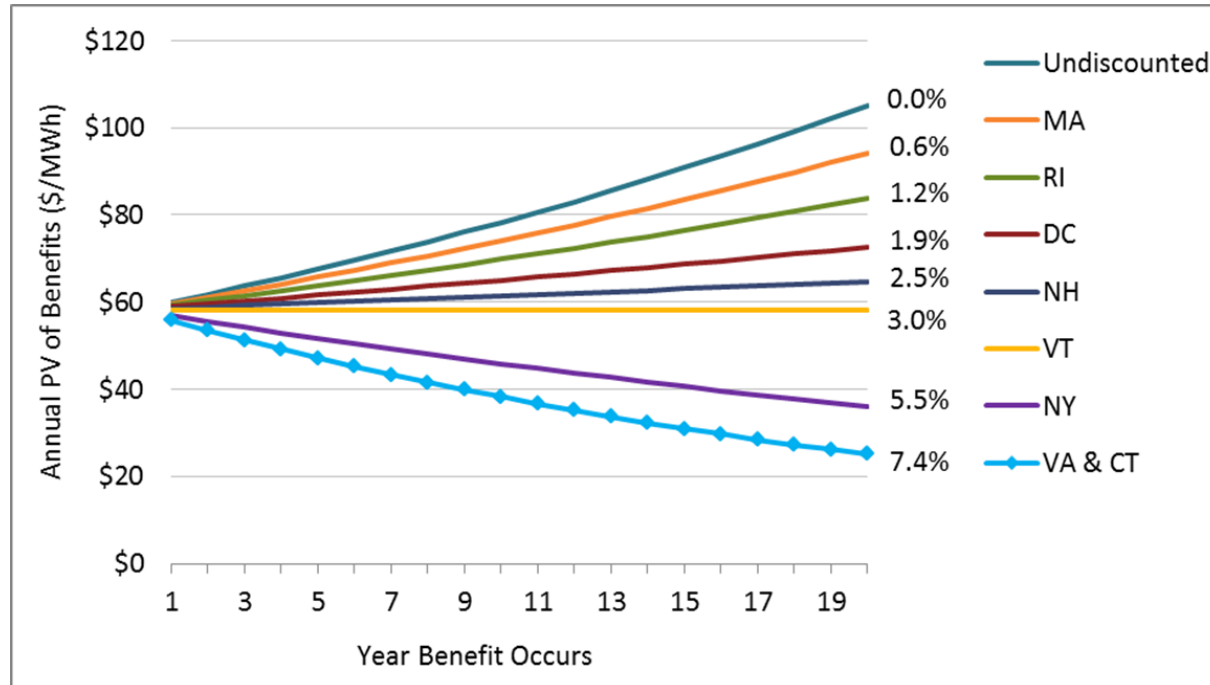


# IRP – But Not IRP



# The Time Warp

- A discount rate equal to the utility WACC will result in EE resources that reflect the time value to utility shareholders.
- It will not result in those EE resources that reflect the time value of utility customers.
- **Whose interests are we trying to serve?**



# The Rate Impact Boogie Man

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- The threat of rate impacts is given way too much weight.
- Rate impacts are often dramatically overstated.
- Rate impacts are rarely analyzed properly.
- Like the Boogie Man, in the light of day, rate impacts are not so scary.
- EE looks much worse than it really is.

# The Pig Pile – When Many Effects are Combined

- Residential Home Energy Retrofits:
  - Policy goals ignored
  - NEBs undervalued
  - TRC Mix and Match
  - Discount rate undervalues long-term benefits
- Residential New Construction experiences the same problems.
- These basic programs, addressing critical sectors and markets, are highly undervalued.



# A Better Approach to EE Valuation

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Lessons from the Renewable Portfolio Standard.

Minimum target EE savings (as a percent of sales).

- Leading states: 2% per year
- Laggard states: 1% per year and rising each year to 2%.

No need to justify this EE on the basis of cost-effectiveness.

- States can, and should, exceed the target, to the extent it is cost-effective.

Use the Resource Value Framework to assess cost-effectiveness.

- See <http://www.homeperformance.org/policy-research/projects-initiatives/cost-benefit-testing>

Portfolio must include “core” EE programs, regardless of whether they are currently cost-effective.

# Core Efficiency Programs (examples)

## Low Income

- New Construction
- Single Family
- Multi-Family

## Residential

- New Construction
- Home Retrofit
- Products & Services

## Commercial

- New Construction
- Small Retrofit
- Prescriptive
- Custom

## Industrial

- New Construction
- Prescriptive
- Custom

# Contact Information

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# Appendix

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Appendix



# The California Standard Practice Manual

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- The CA Standard Practice Manual is used for efficiency screening in essentially all states.
  - The Societal Cost test, the Total Resource Cost test, the Utility Cost test, the Ratepayer Impact Measure test, and the Participant test.
- However, the CA Manual is woefully inadequate for our needs.
  - Energy policy goals are explicitly not addressed.
  - Non-energy benefits are explicitly not addressed.
  - Hard to quantify benefits are not addressed.
  - The TRC test is not well defined.
  - The RIM test does not provide the information on rates that regulators need.
- Conclusion: It is time to break free of the CA Manual.

# The Resource Value Framework

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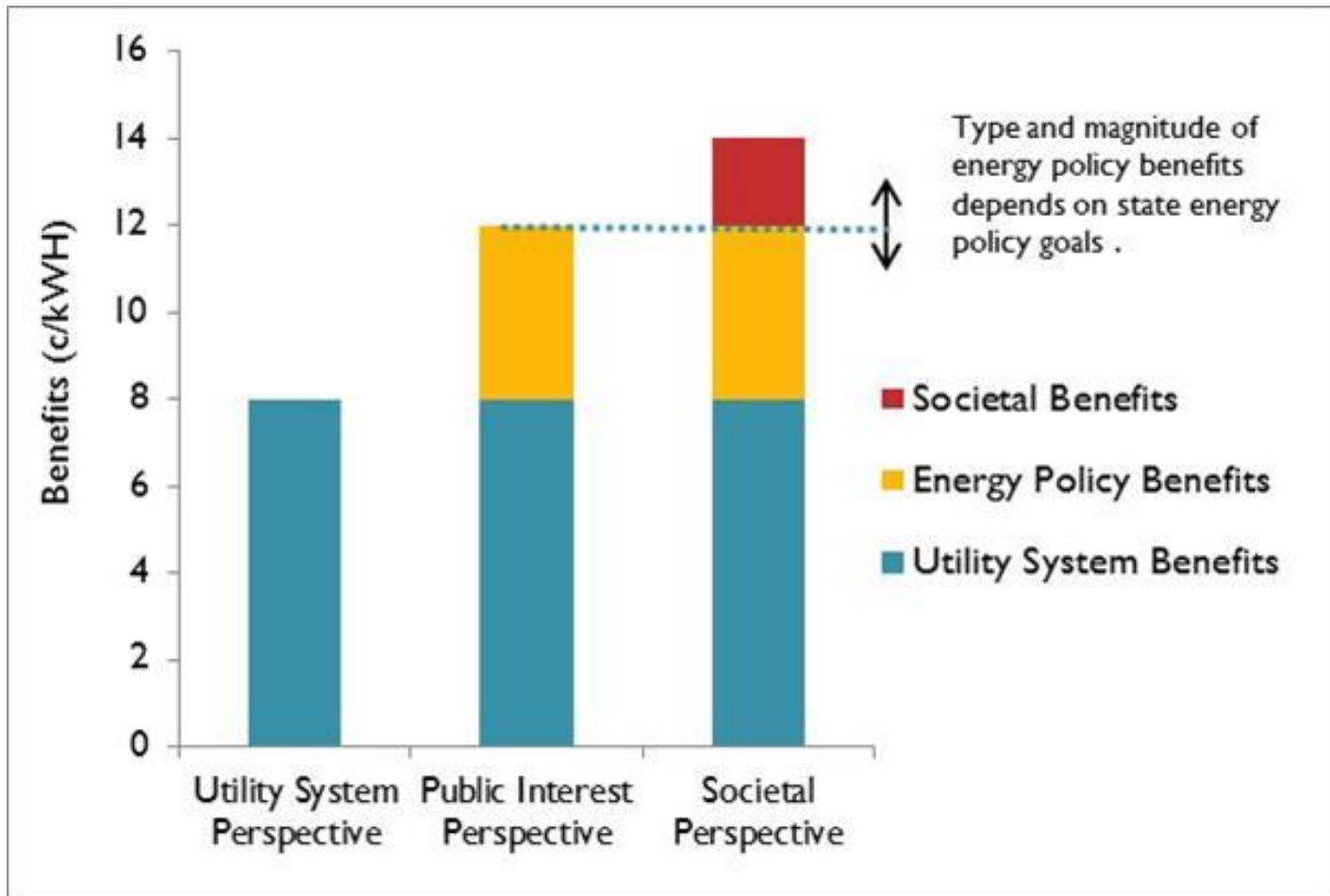
1. Developed through the National Efficiency Screening Project.
  2. Builds off of the existing screening tests; but is not confined to any one of them.
  3. Allows flexibility for each state to determine an efficiency screening test that best meets its goals and interests.
    - But requires states to adhere to key principles.
  4. Clarifies the objective of efficiency screening: to identify resources that are in the public interest.
  5. The framework is “policy neutral.”
    - Each state should apply its own policies to the framework.
    - It is designed to be relevant nation-wide.
- It is still a work-in-progress.
    - See [nhpci.org/caimpaired.html](http://nhpci.org/caimpaired.html) for more information.

# Key Principles of the RVF

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- The Public Interest. The ultimate objective of efficiency screening is to determine whether a particular energy efficiency resource is in the public interest.
- Energy Policy Goals. Efficiency screening practices should account for the energy policy goals of each state, as articulated in legislation, commission orders, regulations, guidelines and other policy directives.
- Symmetry. Efficiency screening practices should ensure that tests are applied symmetrically, where both relevant costs and relevant benefits are included in the screening analysis.
- Hard-to-Quantify Benefits. Efficiency screening practices should not exclude relevant benefits on the grounds that they are difficult to quantify and monetize.
- Transparency. Efficiency program administrators should use a standard template to explicitly identify their state's energy policy goals and to document their assumptions and methodologies.
- Applicability. In general, the Resource Value Framework can be used by regulators in any state to determine if customer-funded energy efficiency resources are cost-effective.

# The Public Interest vs the Societal Perspective



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# Getting the Discount Rates Correct: How Much are Future Benefits Worth?

# Conventional Wisdom on EE Discount Rates

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- Total Resource Cost Test:
  - Utility Weighted Average Cost of Capital
- Utility Cost Test:
  - Utility Weighted Average Cost of Capital
- Ratepayer Impact Measure Test:
  - Utility Weighted Average Cost of Capital
- Participant Test:
  - Participant Discount Rate (wide range)
- Societal Cost Test:
  - Societal Discount Rate (roughly 0%-3% real)

See, for example, NAPEE, November 2008.

# EE Discount Rates from Select States

	Primary Test							
	UCT	Total Resource Cost Test					Societal Cost Test	
	CT	NY	NH	RI	MA	DE	VT	DC
Basis for Discount Rate	Utility WACC	Utility WACC	Prime Rate	Low-Risk 10 yr Treasury	Low-Risk 10 yr Treasury	Societal Treasury Rate	Societal	Societal 10 yr Treasury
Current Discount Rate (Real)	7.43%	5.50%	2.46%	1.15%	0.55%	TBD	3.00%	1.87%

# Discount Rate - Concepts

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- The discount rate should reflect the appropriate “time preference.”
  - i.e., the relative importance of short- versus long-term benefits.
- The purpose of the benefit-cost analysis is to identify those resources that meet a set of regulatory goals:
  - Reduced costs, maintaining reliability, increased system efficiency, mitigating risks, reducing carbon emissions.
- The discount rate chosen must reflect a time preference that is consistent with these regulatory goals.
  - Otherwise, the BCA will not lead to resources that meet these goals.
- The discount rate chosen must reflect a time preference that is relevant to all utility customers as a whole:
  - Not the utility investors’ time preference.
  - Not any one customer’s time preference.
  - Should be a time preference determined by regulators, i.e., what is in the public interest?



# Discount Rates – Recommendations

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- The utility weighted average cost of capital should not be used to set the discount rate for energy efficiency screening.
  - The utility investors' time preference is different than the time preference relevant for choosing new electricity resources.
- Risk benefits should be considered in choosing a discount rate.
  - Efficiency is a low-risk resource, relative to supply-side resources.
  - Efficiency also helps to reduce risk through portfolio diversity.
  - There is no financial risk (i.e., the cost of capital is very low).
- A low-risk discount rate be used for efficiency screening.
  - Based on 10-year US Treasury Bills.
  - Tends to range from 1% to 3%, real.
- The low-risk discount rate should be used for all of the screening tests.
- A participant discount rate can be used for the Participant Cost test.