

PRESENTATION FOR  
**ACEEE**  
**ENERGY EFFICIENCY**  
**FINANCE FORUM**  
CHICAGO, MAY 2017

# **EFFICIENCY POTENTIAL STUDIES: BENEFITS OF INCLUDING FINANCING PROGRAMS**



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# DUNSKY ENERGY CONSULTING



## EXPERTISE

- ▶ Energy Efficiency
- ▶ **Financing Strategies/Programs**
- ▶ Distributed Energy Resources
- ▶ Sustainable Transportation
- ▶ Greenhouse Gas Reductions

## SERVICES

- ▶ Design and evaluation of programs, plans and policies
- ▶ Strategic & regulatory support
- ▶ Technical & analytical support
- ▶ Facilitation & consultation

## CLIENTELE

- ▶ Utilities
- ▶ Governments
- ▶ Solution Providers
- ▶ Large consumers
- ▶ Non-profits

# OUTLINE

1. HOW CAN FINANCING BE CAPTURED IN POTENTIAL STUDIES ?

2. WHAT CAN POTENTIAL STUDIES TELL US ABOUT THE NEED/MARKET FOR FINANCING ?

3. WHAT CAN WE LEARN FROM POTENTIAL STUDIES TO HELP DESIGN EFFECTIVE FINANCING POLICY-PROGRAMS ?

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## POTENTIAL STUDIES

**Efficiency Potential Studies** are *high-level* assessments of potential saving opportunities used by states and utilities to set targets and plan programs.

	Technical Potential	Economic Potential	Achievable Potential
<b>Savings/ Measure Screening</b>	All measures	Cost-Effective Measures	Market Barriers and Participant Economics
<b>Considerations</b>	No Program	No Program	Incentives + Financing Programs

### Opportunities For Financing Assessment: Study Inputs

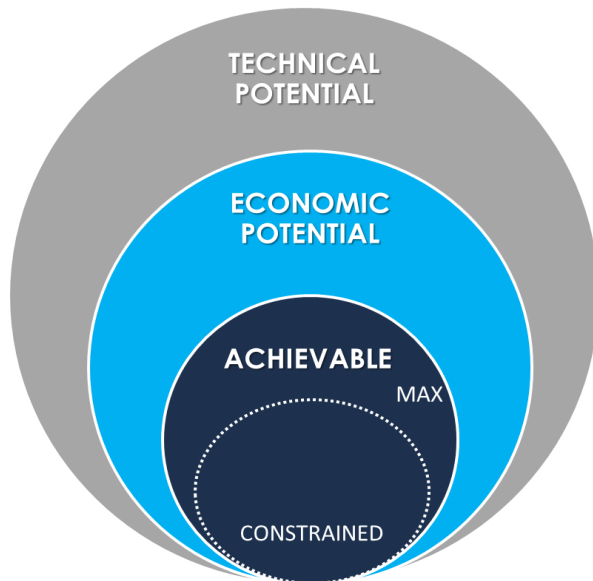
Total Market Size	Baseline Market Condition	Energy Saving Estimate	Barriers Assessments and Surveys
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# HOW FINANCING IS CAPTURED IN POTENTIAL STUDIES

## FINANCING IMPACTS



**Financing acts to increase the Achievable Potential.**



- 1. Reduce borrowing costs – Speed payback**
  - ▶ Low interest financing
  - ▶ Loan Loss Reserves fees that reduce credit risk
- 2. Reduce aversion to long payback measures**
  - ▶ Long-term transferable financing: PACE, Leases
  - ▶ Pay for performance
- 3. Reduce barriers – such as access to capital**
  - ▶ Point of sale / incentive program origination
  - ▶ Relaxed underwriting

# HOW FINANCING IS CAPTURED IN POTENTIAL STUDIES PROGRAMS TO INCLUDE



*The Choice of Programs is Largely Dependent on Study Scope*

Decreasing Applicability

- Utility Delivered/Sponsored Programs**
  - On-Bill Financing/Repayment
  - Low-interest loans
- State and Rate-Payer Sponsored Programs**
  - PACE (e.g. Vermont, California)
  - State sponsored public building revolving funds
  - Green Bank Programs
- Federal Government Programs: HUD and FHA**
- Private Lending: Equipment Leases, EPCs and ESAs**





## IMPLICIT DISCOUNT RATES

### ■ Interest Rate (IR):

Borrowing Cost

*Market interest rates*

### ■ Discount Rate (DR): “Rational”

Time and Risk/Uncertainty

*Used by customer to determine*

*Present Value (PV) of cashflows*

### ■ Implicit DR (iDR): “Behavioral”

Time, Risk and Barriers

*Derived from a population of  
customers’ actual decision-making*

*iDR can range from 20%-100%++*

Relative discount rates  
and determining factors

50%

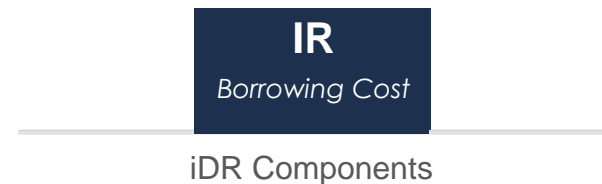
40%

30%

20%

10%

0%







## ① Reduced Cost of Capital (IR)

*e.g. Low interest loans*

$$PCT = PV(\text{Benefits}) / PV(\text{Costs})$$

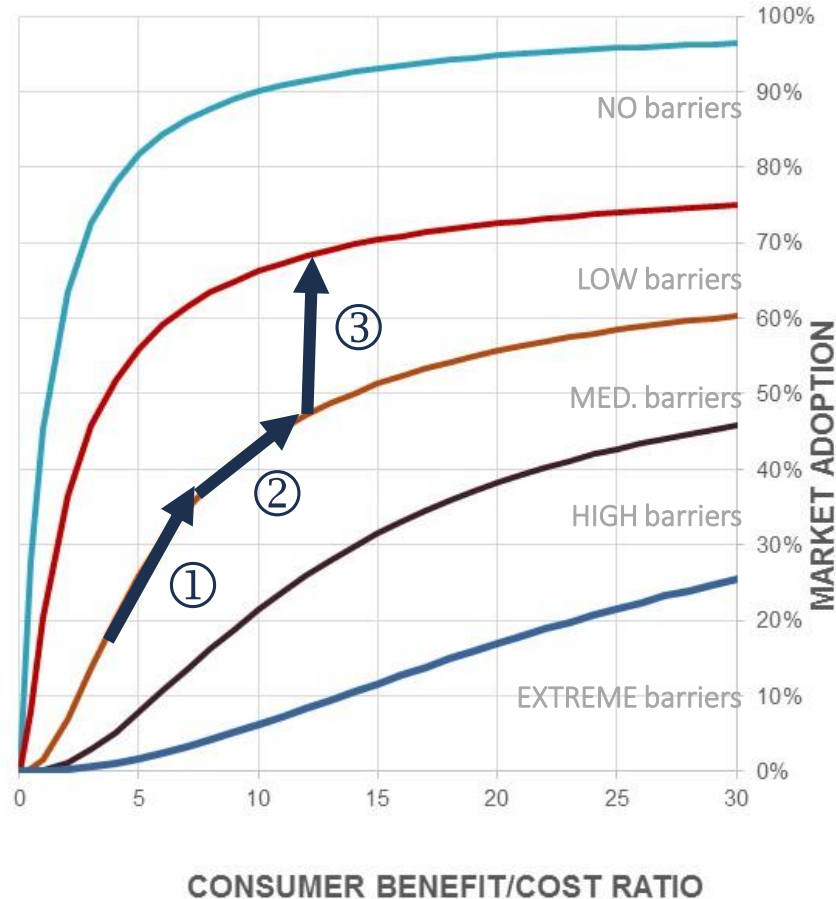
## ② Reduced Long-Payback Penalty

*e.g. OBF, PACE, Equipment Leases*

## ③ Reduced Barriers and Risks

*e.g. Increased access to financing, integration with incentives*

*These impacts can be additive*



**Financing Impact =  $\Delta$  Adoption**

**\*Barrier curves have associated iDR**

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# ASSESSING THE NEEDS AND IMPACTS

## BARRIERS ADDRESSED



	Barrier	Financing Program Tools
Directly Addressed	<b>First-cost and access to financing</b>	<ul style="list-style-type: none"> <li>• Lighter underwriting criteria (e.g. utility bill payment history),</li> <li>• Loan loss reserves and Guarantees</li> <li>• Point-of-sale / incentive program origination</li> </ul>
	<b>Organizational customs or practices</b>	<ul style="list-style-type: none"> <li>• Encourage focus net bill impacts inclusive of savings (e.g. extending beyond the typical 3 to 5-year C&amp;I hurdle rates)</li> </ul>
	<b>Misplaced or split incentive</b>	<ul style="list-style-type: none"> <li>• Transferability to tenants or future owners after sale of new or existing properties</li> </ul>
Indirectly Addressed	<b>Performance Uncertainties</b>	<ul style="list-style-type: none"> <li>• Savings guarantees,</li> <li>• Payments based on achieved savings.</li> </ul>
	<b>Hassle or transaction costs</b>	<ul style="list-style-type: none"> <li>• Utility-arranged financing linked with incentives (OBF)</li> <li>• Point-of-sale / incentive program origination</li> </ul>
	<b>Bounded rationality</b>	<ul style="list-style-type: none"> <li>• Encourage cashflow or NPV analysis</li> </ul>



## ■ Best-in-Class Programs Tailored to Specific Markets

- ▶ Residential Whole Home
- ▶ Residential General Measures
- ▶ Municipal, University, Scholl and Healthcare (MUSH)
- ▶ Small Business
- ▶ Large Commercial and Industrial

## ■ Setting iDR and reductions: Surveys, program data, other jurisdictions

	Residential	Non-Residential
iDR range (published)	Typically 25%-100%	Typically 15%-50%



- **Incremental impact of financing on achievable potential**
- **Total market for financing assessed**
  - ▶ Ratio of incremental costs to total costs
  - ▶ Portion of measures that benefit from access financing
- **Assess the impact of constrained financing capital**



**TOP-LEVEL RESULTS**  
(costs and savings)

Spotlight  
**ECONOMICS**

\$ 98 M  
Electricity  
(Average Annual)

\$ 145 M  
Natural Gas  
(Average Annual)

\$ 243 M  
TOTAL BUDGET  
(Average Annual)

2.2  
SCT

2.5  
PAC

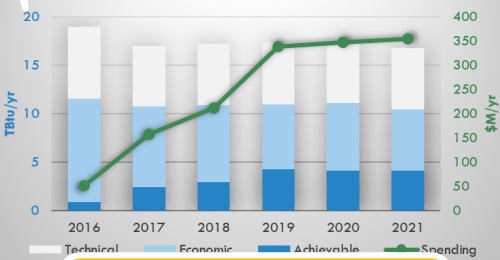
## DASHBOARD VIEW

UTILITY CO 2016-21 DSM Potential

### Critical Numbers

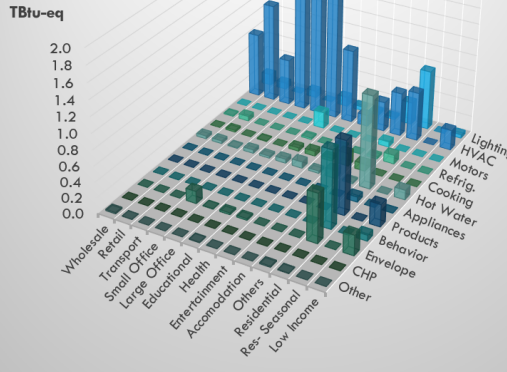
	GWh	MW	TBtu(Gas)	TBtu-eq	GHG Mt
TECH	8987	2398	72	105	7
ECON	4712	1258	49	66	4
ACHV	<b>1888</b>	<b>265</b>	<b>12</b>	<b>19</b>	<b>1</b>
% Sales	0.5%		0.6%	0.6%	

### Potential and Spending



**VISUALIZE RESULTS**  
(by segment/end-use)

### Spotting the Savings



**SCENARIO ANALYSIS**  
(key inputs: IR etc.)

Energy Source

Electric

USER SPACE

### COMPOSE & SELECT SCENARIOS

Select Scenario: **BASE**

Scenarios: **BASE** | SENS.-A | SENS.-B

#### Discount Rates

	BASE	SENS.-A	SENS.-B
Utility (elec)	6.0%	6.0%	6.0%
Utility (gas)	6.0%	6.0%	6.0%
Societal (both)	10.0%	2.0%	2.0%
Participant (both)	25.0%	3.0%	3.0%

#### Sensitivities

Screening Test	<b>Societal (SCT)</b>		
Avoided Cost Scen.:	<b>High Gas - High GHG</b>		
GHG OR (\$/tonne)			
Avoided Costs (% chg.)	0%	20%	-20%
Rates (% chg.)	0%	20%	-20%
Measure Cost (% chg.)	50%	-20%	20%
Incentives (% chg.)	0%	20%	-20%
Add non-incent. costs	Yes	Yes	Yes

**Test Various Program Models**

### USER SPACE: CHOOSE SCOPE OF ANALYSIS

select | click filter button X | to clear filters and select all | press CTRL+click to add or remove individual components

#### Sector

- Commercial
- Low Income
- Residential

#### Segment

- Accommodation
- Large Office
- Retail
- Educational
- Low Income
- Small Office
- Entertainment
- Others
- Transport
- Health
- Residential
- Wholesale

#### End Use

- Appliances
- Envelope
- Motors
- Solar
- Behavior
- Hot Water
- Other
- CHP
- HVAC
- Products
- Cooking
- Lighting
- Refrig.

#### Measure Type

- Additions on Existing
- Early Replacements
- New Construction/Installs
- Replace on Burnout

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### **Opportunities:** Specific measures to focus program

- ▶ Programs with the highest potential savings
- ▶ Measures with marginal B/C ratio and long paybacks



### **Market need:** Who needs financing

- ▶ Barriers: Segments where there is a large spread between Economic and Achievable Potentials



### **Financing need:** How much capital is required

- ▶ Size of market by sector/segment (C&I, Residential etc.)
- ▶ Total value of savings for specific measures/segments



### **Program Features:** What impacts can they have?

- ▶ Scenario analysis on features: Interest rate buy down, expanded access etc.



## 1. Potential Studies offer significant opportunity

- ▶ Valuable market data assembled as inputs
- ▶ Scope can include specific financing program tools and products relevant to stakeholders

## 2. Assess impacts on Achievable Potential

- ▶ Reduced borrowing costs
- ▶ Reduced aversion to long-term paybacks
- ▶ Reduced financing access barriers

## 3. Apply results to target setting and strategy design

- ▶ Incremental bump to potential
- ▶ Constrained potential due to capital availability
- ▶ Highlights key markets and measures for financing

**Potential Study  
Inputs**

**Total Market  
Size**

**Baseline  
Market  
Condition**

**Energy Saving  
Estimate**

**Barriers  
Assessments  
and Surveys**



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