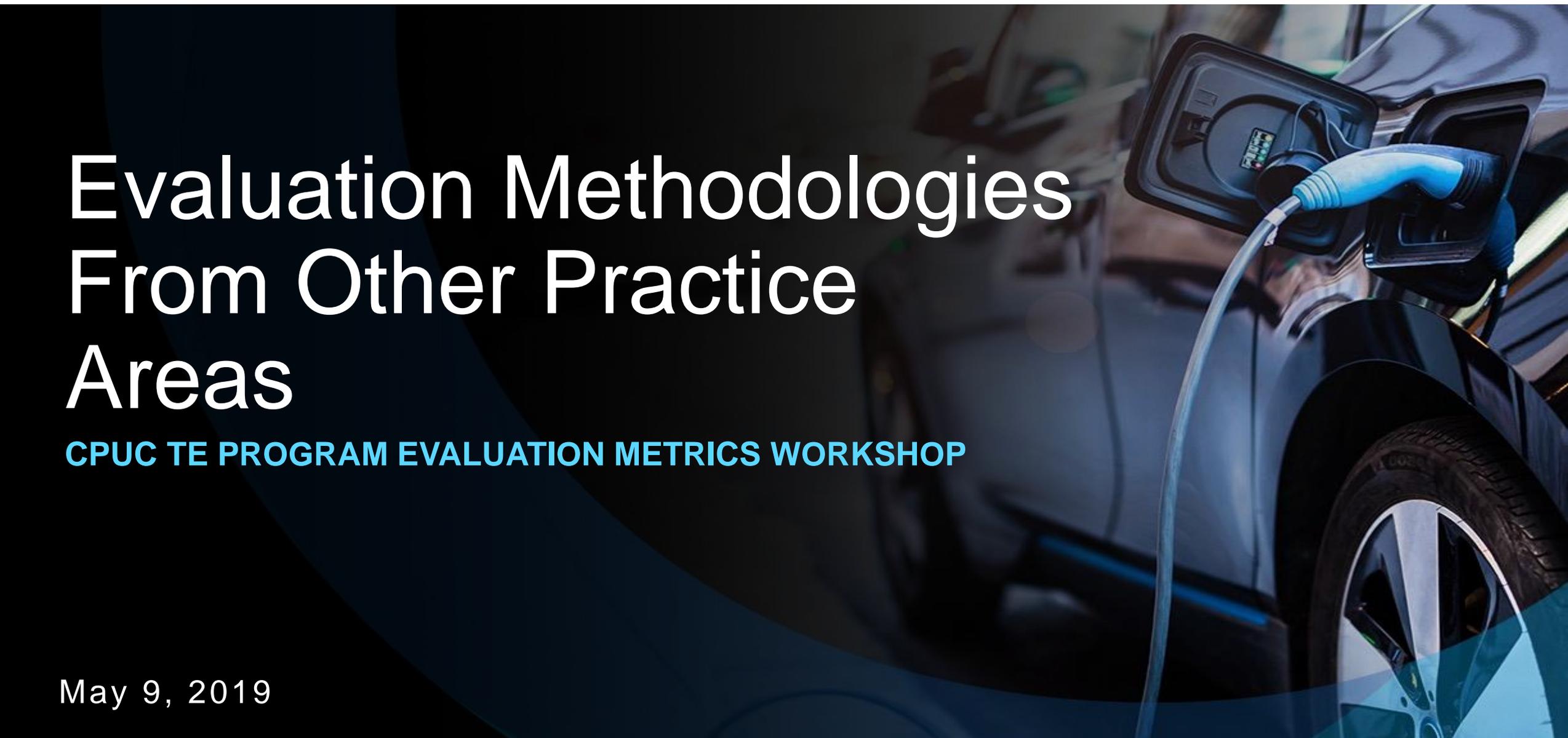


CADMUS

# Evaluation Methodologies From Other Practice Areas

CPUC TE PROGRAM EVALUATION METRICS WORKSHOP

May 9, 2019



# Introducing Cadmus's EM&V

Exceed expectations. Challenge and reward our team. Grow and prosper. Make a difference.

**Since  
1983**

Employee-owned  
social good  
consultancy

**33 years** of

helping our clients address  
complex challenges in a highly  
collaborative environment



Started with  
**2** Co-Founders,  
now  
**500+** strong

**19**  
offices



# Outline

- **Evaluation Philosophy**
- Evaluation Tools
- Transportation Electrification: Evaluation Opportunities and Challenges

# EM&V definitions

Evaluation, measurement, and verification (EM&V)

.....  
Evaluation is at the program & portfolio levels

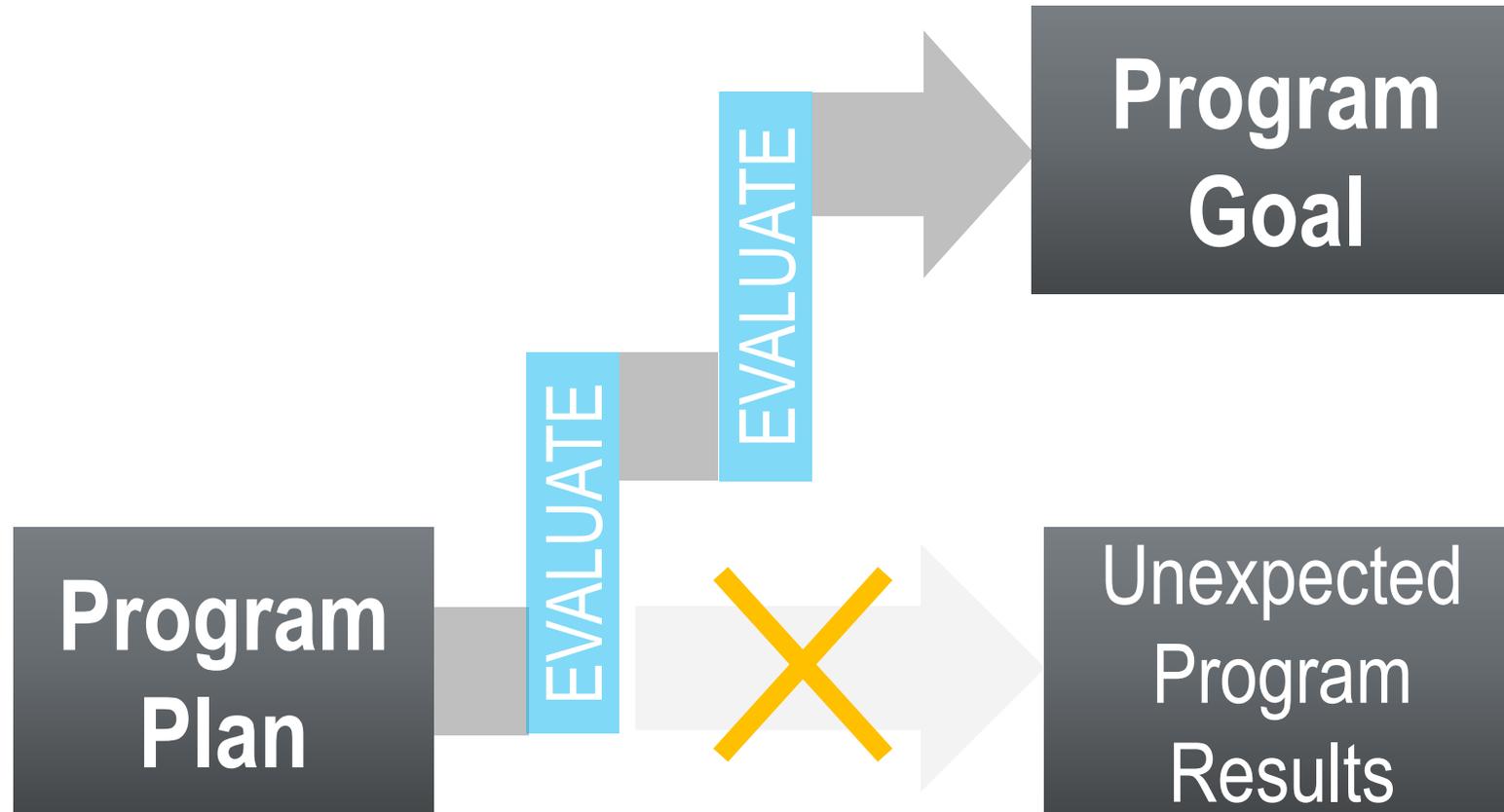
.....  
Measurement is at the project level

.....  
Verification is at the project level

.....  
Both M and V are often components of E!



# Why do EM&V?



# Evaluation types

All require solid researchable questions as the foundation



# Outline

- Evaluation Philosophy
- **Evaluation Tools**
- Transportation Electrification: Evaluation Opportunities and Challenges

# Example tools of the trade

Not a comprehensive list

## Process Evaluation

- Documentation review
- Pipeline and processing review
- Risk/opportunity analysis
- IDIs (administrator, implementor, stakeholder, etc)
- Customer surveys and intercept surveys
- Stakeholder engagement
- Focus groups

## Impact Evaluation

- Verification
- Regression
- Billing analysis
- Difference-in-differences
- Sampling techniques
- RCTs
- Propensity score matching
- Random encouragement
- Random recruit deny/delay
- Site visits

## Market Assessment

- Market data analysis
- GIS analysis
- IDIs with market actors
- Delphi panels
- Customer segmentation
- Choice-based conjoint analysis

# Key Players

Interview key players in the program

Utility staff

Program managers and staff

Market actors (e.g., dealers, EVSPs, contractors)

Participating customers

Other stakeholders

Are there others who could give insight to the program?

Nonparticipating dealers

Nonparticipating customers

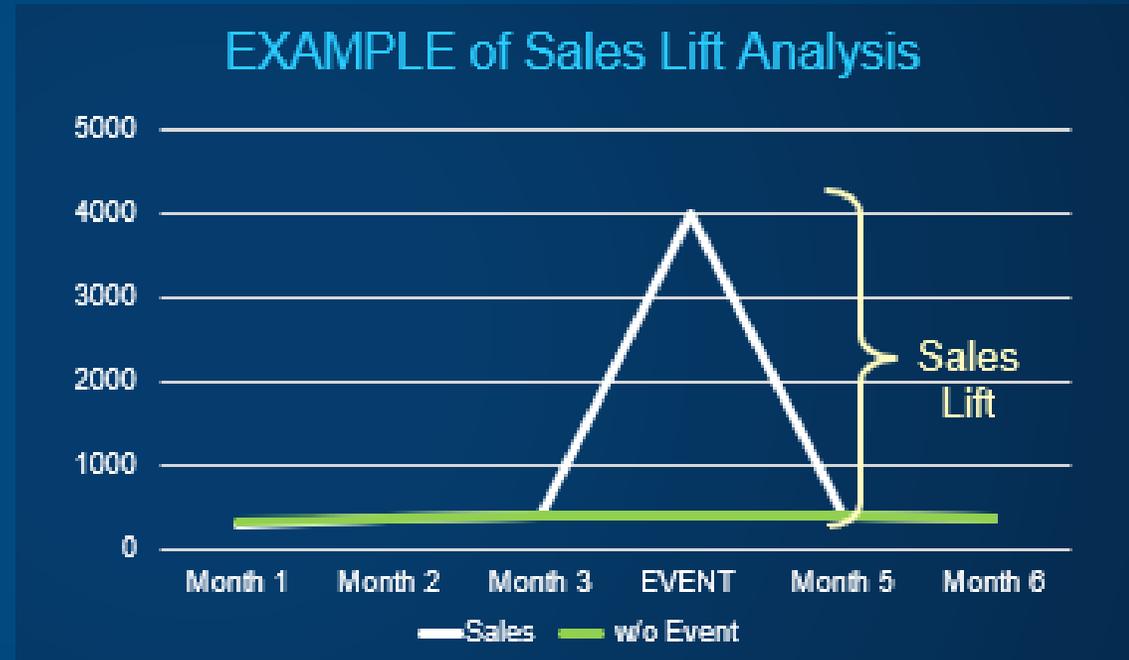
Program managers from other utilities with similar programs

Industry experts

# Application: Dealership (assess market lift)

## LED Sales Lift Analysis

- Uses comprehensive data on program bulb sales before, during and after event (obtained from retailers)
- Analysis by type of bulb
- Compare actual sales during event to likely sales during same period with no event



## How would it apply at a dealership?

- Vehicle purchases subject to additional seasonal patterns
- Cars are much more differentiated
- Difference in differences with comparable dealerships?

# Application: Public Charging (capture data on mobile participants)

Intercept surveys where “participants” or “users” not tracked

## Traditional Evaluation

- Often done for midstream retail programs
- To gather critical data not available through other means for evaluation
  - Baseline equipment (e.g. bulb) being replaced
  - Leakage
  - Early replacement of old equipment

## Transportation Electrification

- Could be applied at any public charging location
  - Understand the site – are people waiting there? Are there peak periods?
  - Is the EVSP able to facilitate online methods or is intercept the only option?
- To gather data on how important this charging location is for user – access to charging elsewhere (home, work), whether the user would otherwise frequent this location, their satisfaction, etc

## Common needs:

- Should be short (5-6 questions)
- Requires approval from retailer (or site host)

# Application: Workplace or public charging (inform design)

## Survey Sampling & Respondent Characteristics



### EV Owners (n=271)



- Own or lease an EV
- Utility customer
- Employed, does not work from home
- Does not work in market research

### Prospective EV Owners (n=411)

- Interested in purchasing or leasing an EV within 2 years
- Utility customer
- Employed, does not work from home
- Does not work in market research

	Avg. Age	SF Dwelling	Income >\$100k	Bachelor's +
 EV Owners	46	84%	66%	80%
Non-EV Owners	46	91%	51%	66%

# Application: Workplace or public charging (inform design)

## Choice-Based Conjoint Model

### Payment Approach

- Free/fully subsidized
- \$15/m unlimited
- \$30/m unlimited
- \$1.50 per hr. charge



### Type Of Charging

- Level 1
- Level 2
- D/C Fast Charge



### Availability

- Plenty
- Share
- Limited



### Time Limit

- No limit
- Must move within 60 min of charge completion



### Parking Proximity

- Close
- Moderate
- Far



# Outline

- Evaluation Philosophy
- Evaluation Tools
- **Transportation Electrification: Evaluation Opportunities and Challenges**

# Challenges

Not entirely unique to TE, but arguably more acute in TE

Disentangling  
program impacts

Complexity of  
participant  
motivation

Customer/host  
learning curve

Confidential  
operational data

Diversity of  
vehicles, EVSE,  
and use cases

Changes to  
schedule may  
require adaptive  
approach to eval

Limited historical  
data and  
standardization

Whether to  
purposely design  
control groups in  
each case?

PRPs/SRPs  
could impact  
each others'  
success

# Opportunities

Involve evaluators early for evaluability

Leverage non-intrusive data collection

Develop sophisticated, up-to-date understanding of customers and their barriers

Customize approach to current position along the technology curve

TE is a massive market with substantial momentum and mandates. Important to tailor evaluation approaches accordingly.

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# Thank You

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