Load Impacts and Customer Choice Results from SMUD's Two-Year Smart Pricing Options Pilot

Dr. Stephen George

National Town Meeting on Demand Response and Smart Grid

Washington, D.C.
May 21, 2014

Agenda

- **Summary of Smart Pricing Options pilot**
- **Load impacts for two summers**
- **Impact persistence**
- **Customer acceptance and attrition for default and opt-in pricing plans**
- **Key drivers of customer acceptance and attrition**
- **Conclusions**

Nexant

U.S. Department of Energy Disclaimer

- **Acknowledgement:** "This material is based upon work supported by the Department of Energy under Award Number OE000214."

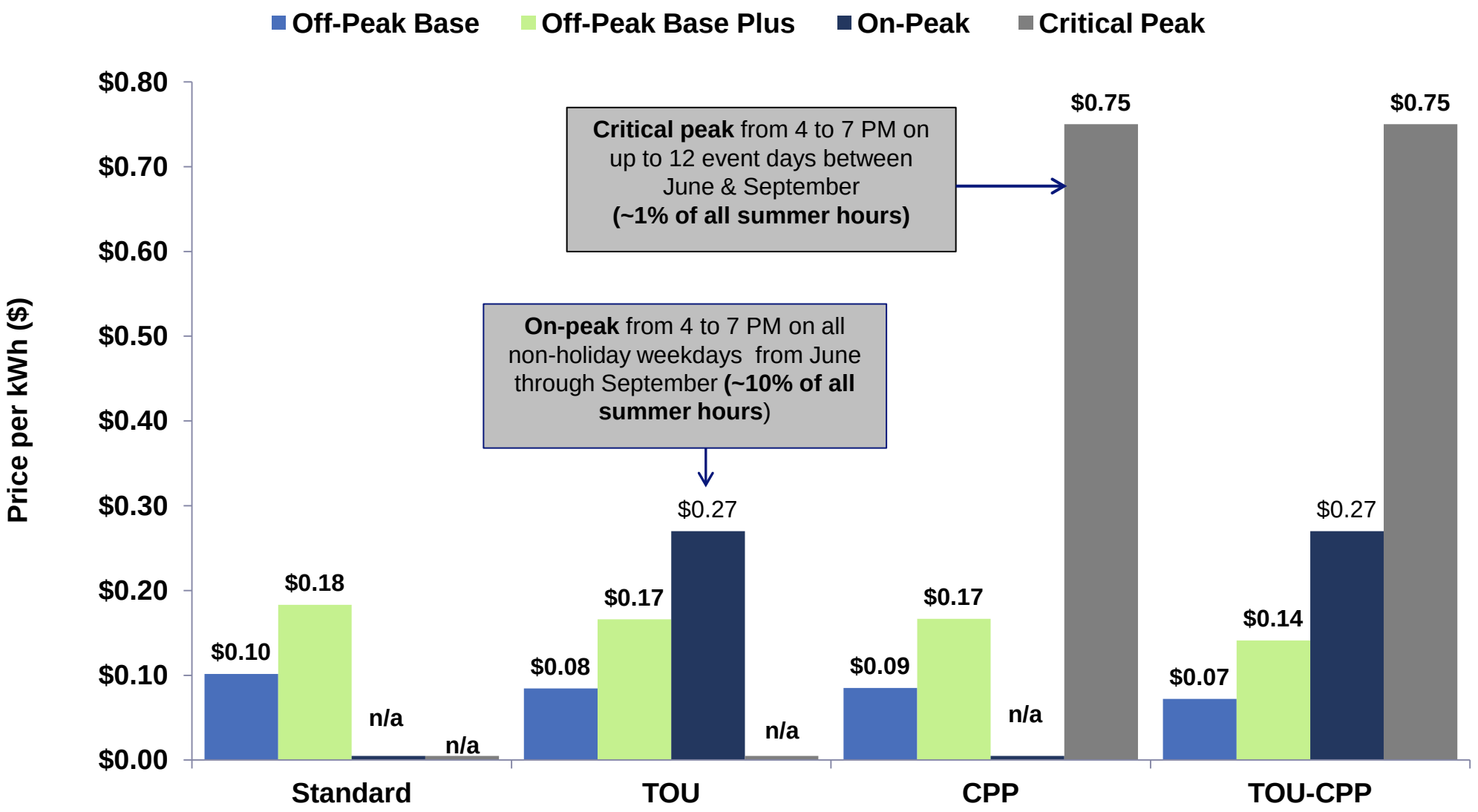
- **Disclaimer:** "This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof."

A little about SMUD

- **Sacramento County in Northern California**
- **Municipal Electric Utility**
  - Governed by a Board of Directors
- **600,000 Customers**
  - 540,000 Residential
  - 60,000 Commercial
- **Summer-Peaking Load (Air Conditioning)**
  - Residential Peak: 4-7pm June-September
  - Peak load ~3000 MW, of which 400 MW = 40 hours
- **Energy Mix**
  - Hydro
  - Natural gas-fired generators
  - Renewables (solar, wind)
  - Wholesale market

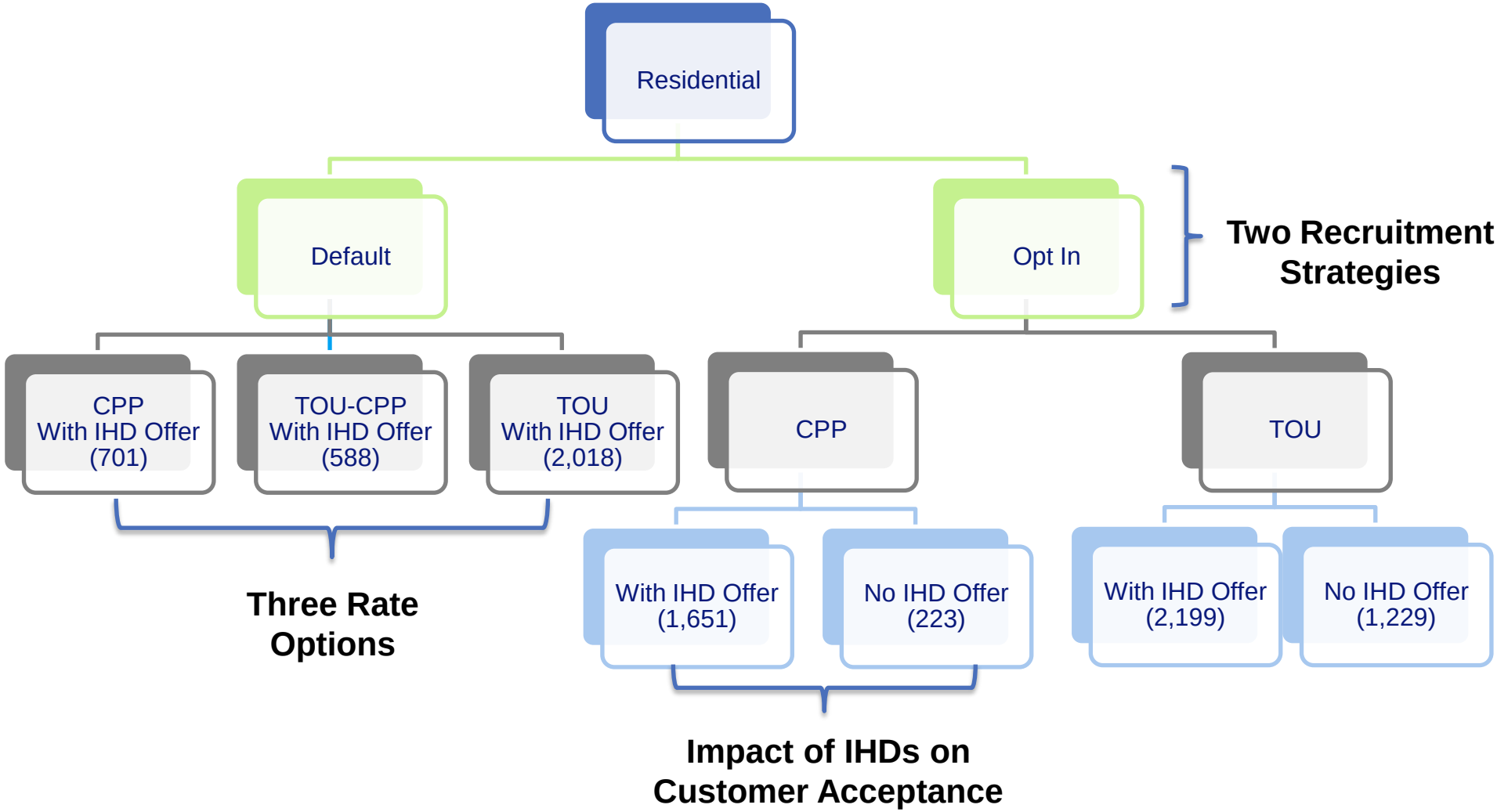
Nexant

Key features of SPO – three pricing plans



Nexant

Key elements of Smart Pricing Options pilot

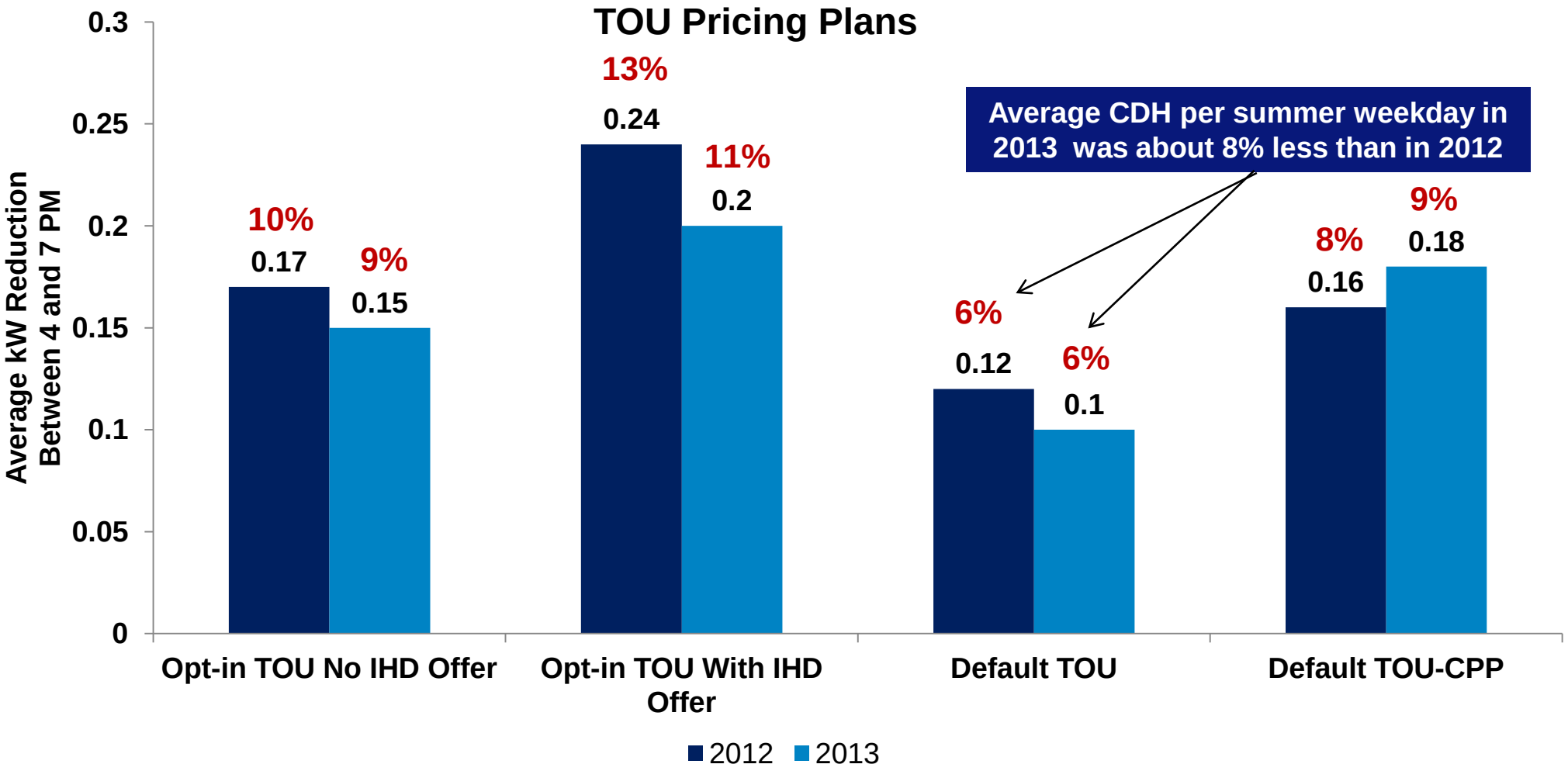


Total enrollment including deferred groups = 12,027; Total # of customers receiving offers (including deferred groups) = 53,798; Total # of customers in SPO including controls = 99,661

Nexant

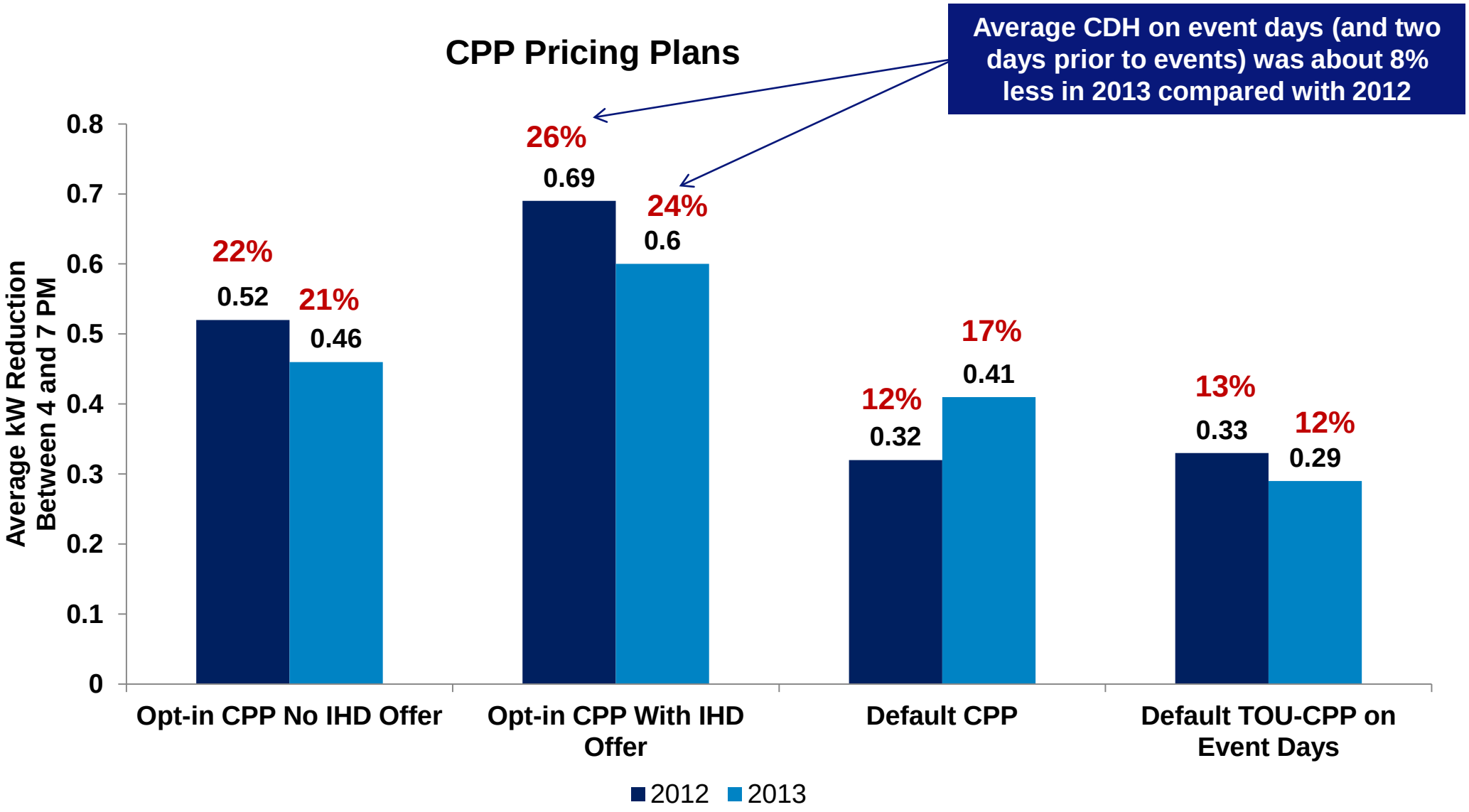
Load impacts were significant for both opt-in & default pricing plans and changed little across the 2 summers

None of the differences in impacts across summers is statistically significant.



Nexant

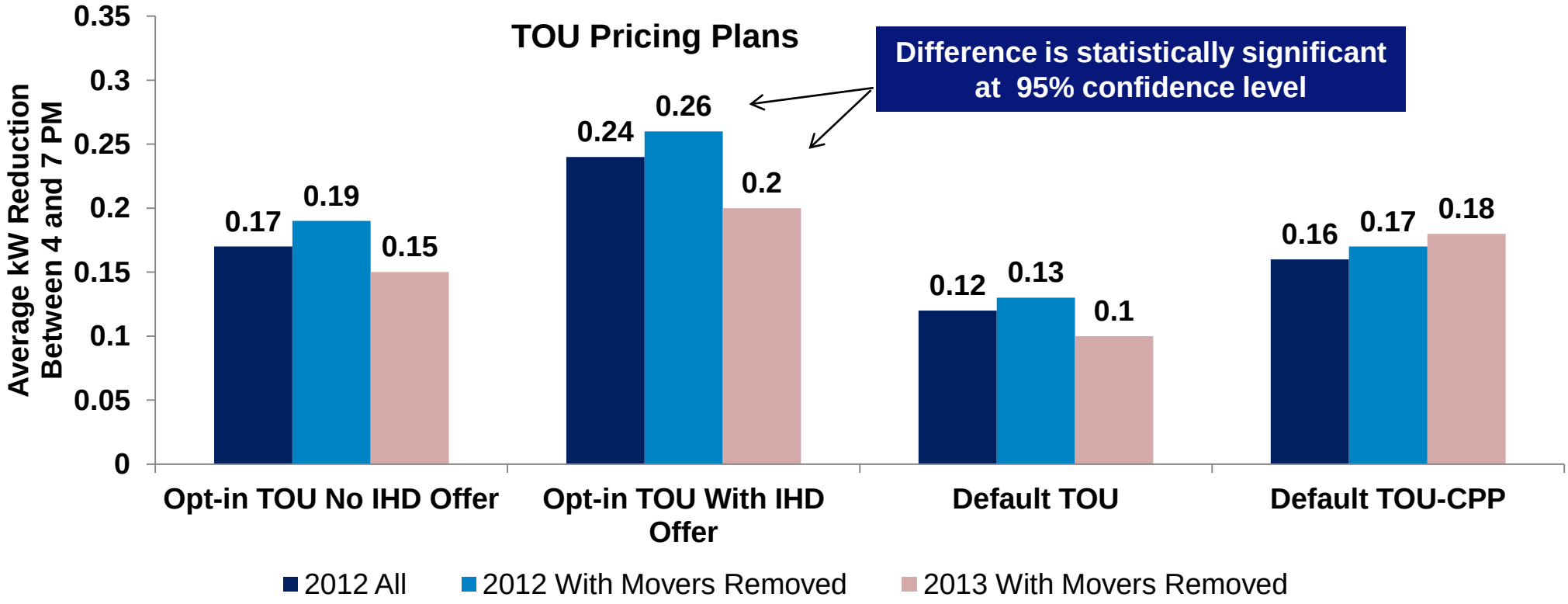
Load impacts were higher for CPP than for TOU plans – and quite high for default CPP



Nexant

An assessment of impact persistence requires holding the population constant across the two summers

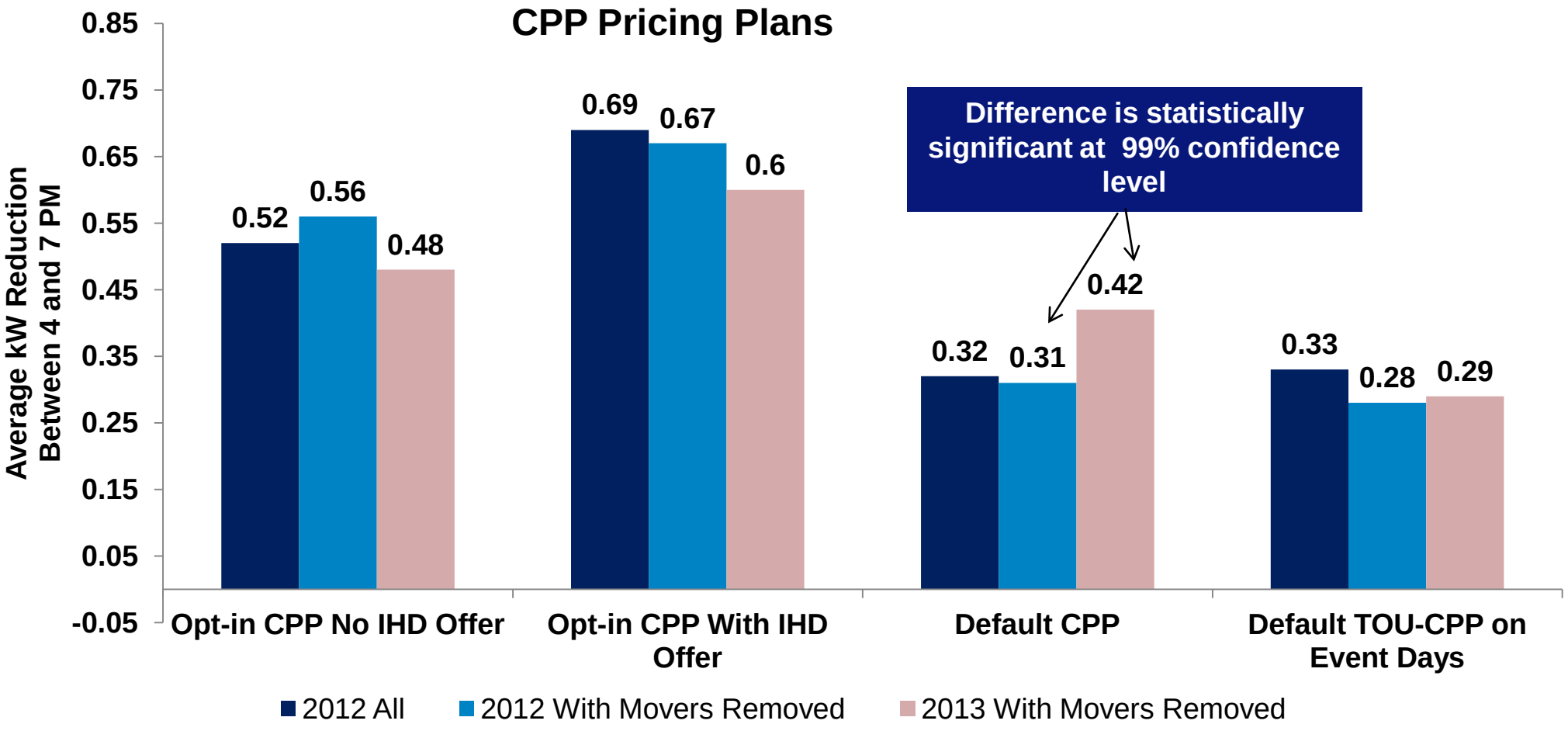
Roughly 25% of participants enrolled on June 1, 2012 were gone by September 30, 2013, primarily due to move outs. Impacts were re-estimated after eliminating movers in both years and only one of the differences, for opt-in TOU with the IHD offer, was statistically significant for the TOU pricing plans.



Nexant

Persistence assessment for CPP pricing plans

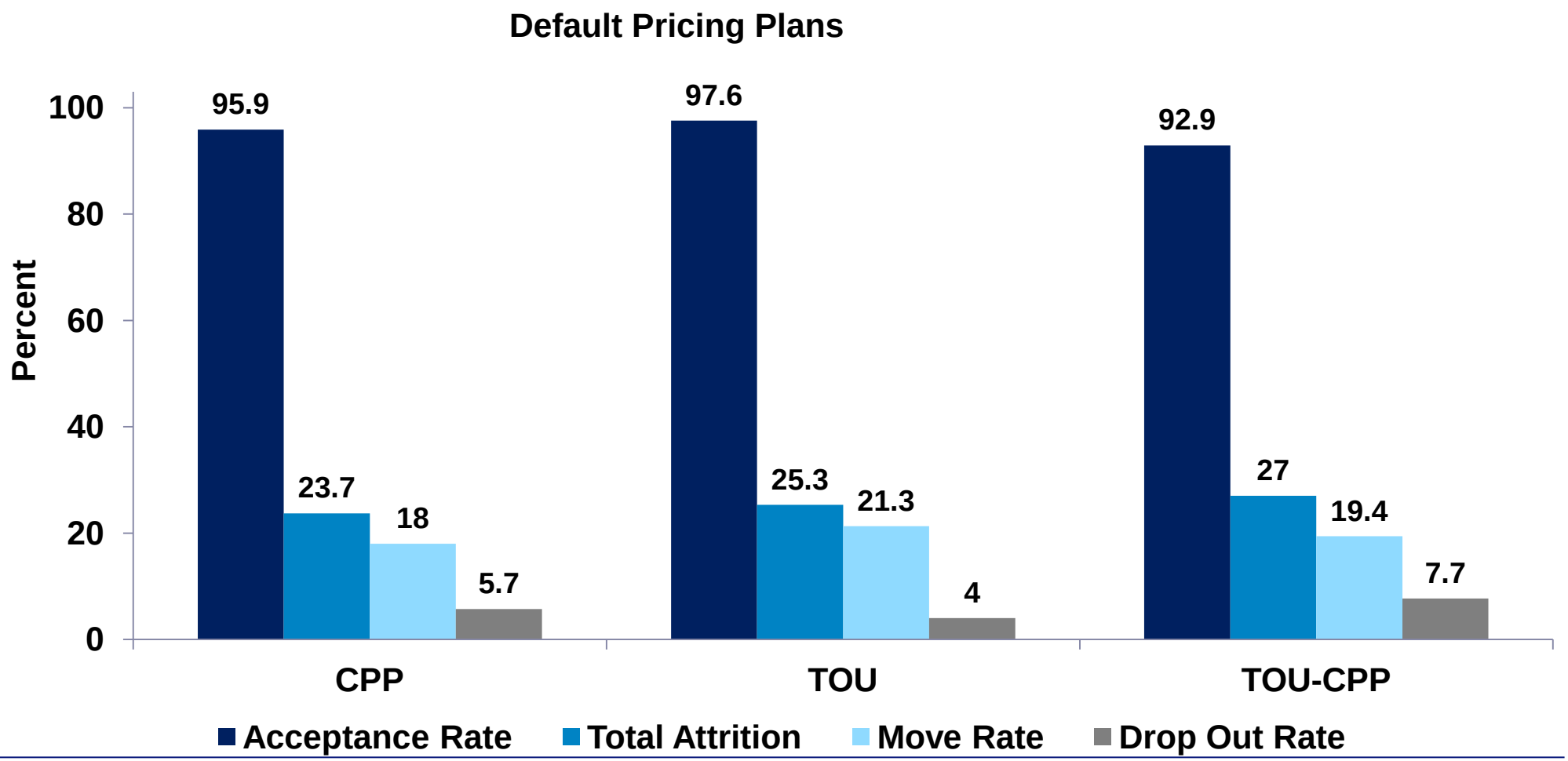
After removing movers from both the 2012 and 2013 treatment and control groups, the difference in impacts across the two years was statistically significant for only one of the four pricing plans, the default CPP plan – impacts for this group INCREASED between 2012 and 2013, in spite of 2013 having cooler event days than in 2012.



Nexant

Only 2% to 7% of default customers opt-out out before enrollment & only 4% to 8% dropped out over 2 year period

Drop out rates are not materially different across pricing plans

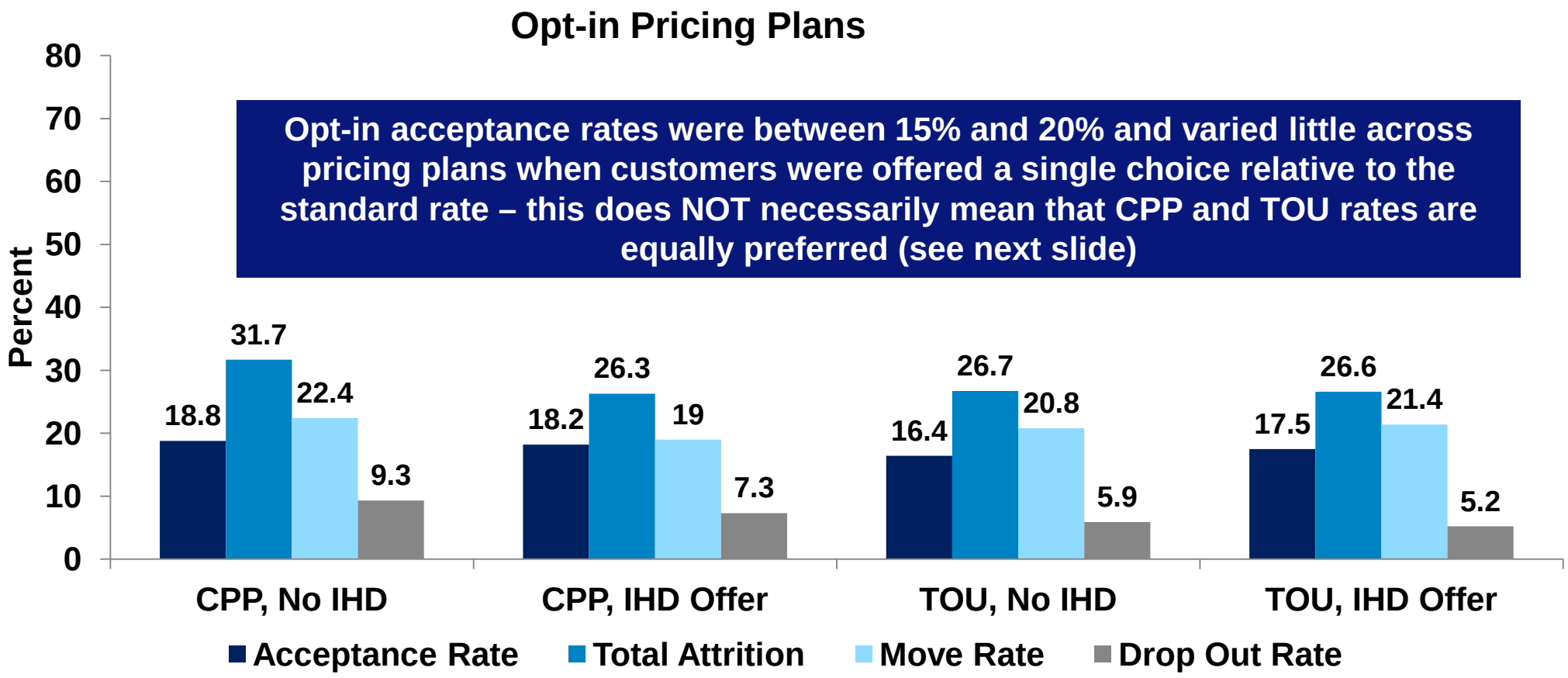


Nexant

Dropout rates for opt-in participants were also low but slightly higher than for default participants

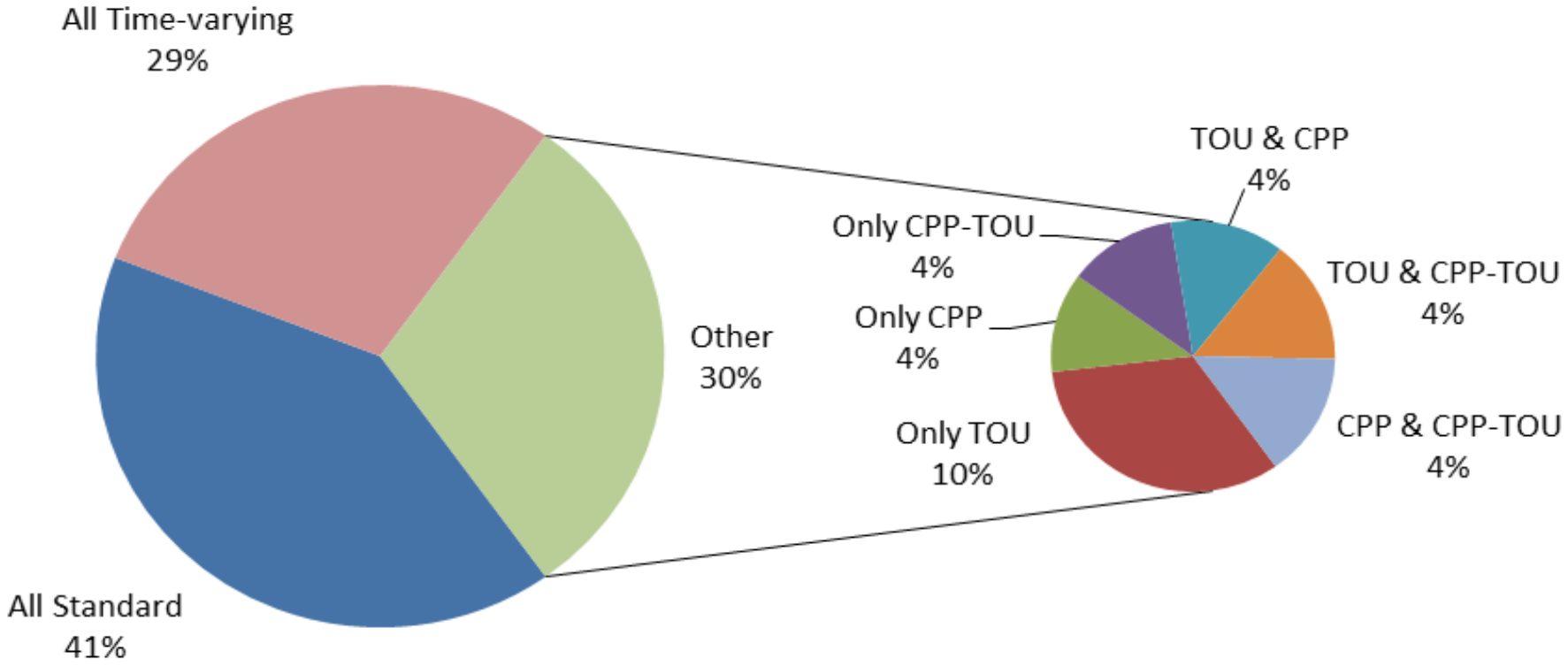
The higher drop out rates for opt-in compared with default plans may be due, in part, to lower awareness of being on the plan among default customers and the fact that more customers on default plans claim they didn't know they could opt out.

Customer churn (movers) was quite high – it would be hard and expensive to keep enrollment constant unless SMUD allowed opt-in rates to migrate with movers



Nexant

A conjoint survey revealed that, if given the choice between TOU and CPP plans, TOU is preferred about 2 to 1



- 59% of respondents said they preferred some type of time-variant rate to the standard tiered rate
- 29% would take any time-variant rate over the standard rate whereas 30% would choose one option over the standard rate but not another

Nexant

Customers who participate in other SMUD programs are more likely to choose TOU/CPP pricing plans

Variable	Likelihood of Choosing TOU	Likelihood of Choosing CPP
EAPR status	EAPR customers more likely to choose rate than non-EAPR customers	EAPR customers more likely to choose rate than non-EAPR customers
IHD offer included	Not statistically significant	Not statistically significant
% structural winner	Positively correlated with choosing rate	Not statistically significant
Carbon Offsets program	Positively correlated with choosing rate	Positively correlated with choosing rate
Received EE loan/rebate	Not statistically significant	Not statistically significant
Energy Help program	Positively correlated with choosing rate	Positively correlated with choosing rate
Green Energy program	Positively correlated with choosing rate	Positively correlated with choosing rate
Enrolled in MyAccount	Positively correlated with choosing rate	Positively correlated with choosing rate

Nexant

Factors affecting the likelihood of dropping off a plan once enrolled are similar for default and opt-in pricing plans

Variable	Drop Outs for Opt-in Plans	Drop Outs for Default Plans
EAPR status	Not statistically significant	EAPR customers less likely to drop out than non-EAPR customers
CPP pricing plan	CPP participants are more likely than TOU participants to drop out	CPP participants are more likely than TOU participants to drop out
TOU-CPP pricing plan	n/a	TOU-CPP participants are more likely than TOU participants to drop out
% structural winner	Structural winners are less likely to drop out	Structural winners are less likely to drop out
Carbon Offsets program	Not statistically significant	Not statistically significant
Received EE loan/rebate	Participants are more likely to drop out	Participants are more likely to drop out
Energy Help program	Not statistically significant	Not statistically significant
Green Energy program	Not statistically significant	Not statistically significant
Enrolled in MyAccount	Not statistically significant	Participants are more likely to drop out

Nexant

Key conclusions

- **Customer acceptance rates for opt-in pricing plans was high and dropout rates were low for all plans**
- **Opt-out rates for default customers were really low, both prior to enrollment and over a two year period**
- **Opt-in rates were higher and dropout rates were lower for EAPR customers, structural winners and customers enrolled in other SMUD programs for most pricing plans**
- **Given a choice of multiple plans, customers prefer TOU over CPP pricing**
- **Average load reductions were higher for opt-in plans than for default plans but load impacts for all default plans were large and statistically significant**
  - Given the much higher enrollment rates for default plans, aggregate impacts would be much larger under default plans than opt-in plans
- **Load impacts persisted across the two summers**

For comments or questions, contact:

Dr. Stephen George
Senior Vice President, Utility Services
sgeorge@nexant.com

Nexant, Inc.
101 Montgomery St., 15th Floor
San Francisco, CA 94104
415-948-2328