RIVERSIDE PUBLIC UTILITIES

Electric Vehicles Workshop

February 23, 2011

WATER | ENERGY | LIFE

PUBLIC UTILITIES

About Riverside

- **11th Largest City in CA – 300,000+**
- **Four Major Universities**
- **Public Owned Utility – electric and water**
- **106,000 + Customers**
- **Nationally Recognized**
  - Leader in Utility and Environmental Stewardship
  - Clean Energy (20% Renewables)
  - Water and Electric Conservation
  - Reliability
  - Customer Oriented
  - Rates

What We Know

- **Already in Riverside!**
  - Vehicles at or coming to local dealers
  - Alvarez, Metro Nissan, Singh Chevrolet
  - RPU – Chevy Volt
- **EVs carry an investment premium**
  - Car
  - Charging infrastructure (home and public)
- **EVs – possible significant infrastructure investment challenge for RPU**
- **Inquiry by local dealers of RPU infrastructure support**
- **Electric Rules & Rates do not support; therefore**
- **RPU Infrastructure cost recovery will require policy changes**

What We Know (Cont.)

- **Meet Customer Needs/Meet RPU Needs**
  - ➔ Must know customers who purchase and use EVs
- **Pricing and Billing Mechanisms**
- **Address 3rd Party Charging for Public**

  Retail Establishments (Fast Food, Malls)

  Car Dealers

  Library, City Hall

  Point of Sale Ability
- **Marketing and Outreach – Develop Message**

And The Survey Says

- **Interested in Learning about PEV – 25%**
- **Likelihood of Acquiring a PEV - 25% (6%)**
- **When Likely to Purchase/Lease PEV**
  - 38% 2011
  - 52% 2012
- **Value of Utility Charging Options**
  - Utility Provides Intro Info re: basics and safety – 22%
  - Utility Test and approves Home Systems – 25%
  - Utility Runs Public Charging – 34%
- **Want New Homes to Include Chargers – 43%**

EV Charging Impact Grid?

- **Awareness of Infrastructure Challenges Evolving**
- **Level 2 Charging**
- **Clustering**
- **Different from an electric dryer**
- **Reliability Challenges**
- **Transformer Overloading Highly Probable**
  - Study showed that 40% of transformers will fail in older areas of the city if customers install charging stations
- **Taps & Laterals Re-Build**
- **Additional CIP Requirements**
- **Electric Rule Revisions Required**

EV Charging Impact Rates?

- On Peak Charging – increase base load needs
- Off Peak Charging – increase base load needs
- Domestic TOU
- Commercial TOU
- Marginal Cost of Power

Will It Happen?

- **Mayor Has Working Group**
- **Riverside Recognized as a "Leader" in Readiness**

  SCPPA Smart Grid/EV Working Group

  CMUA Electric Transportation Committee

  APPA Smart Grid/EV

  Nashville/Nissan/TDOT Project
- **Adoption Rate Unknown**
- **RPU Residential PV First Adopters - where?**
- **SCE 70+ FTE on EV Program**

Home Chargers

- Approximate 6 kilowatt single output station
- $500 - $5,000 cost to Home Owner
- Separate Meter if EV Rate is developed
- Most homes need service re-build
- Some Customers want City/RPU Assistance
- Cost recovery for System Improvements
- PV and Wood Street First Adopters
- Do-It-Yourself Kits Now Available

Third Party Charging

- Employer Fleet
- Public Parking (Malls, City Hall, Convention Center)
- Transportation Corridors (60/91/215)
- Resale of electricity not currently allowed

Fast Chargers

Level 3
McDonalds
480 V/60 kW

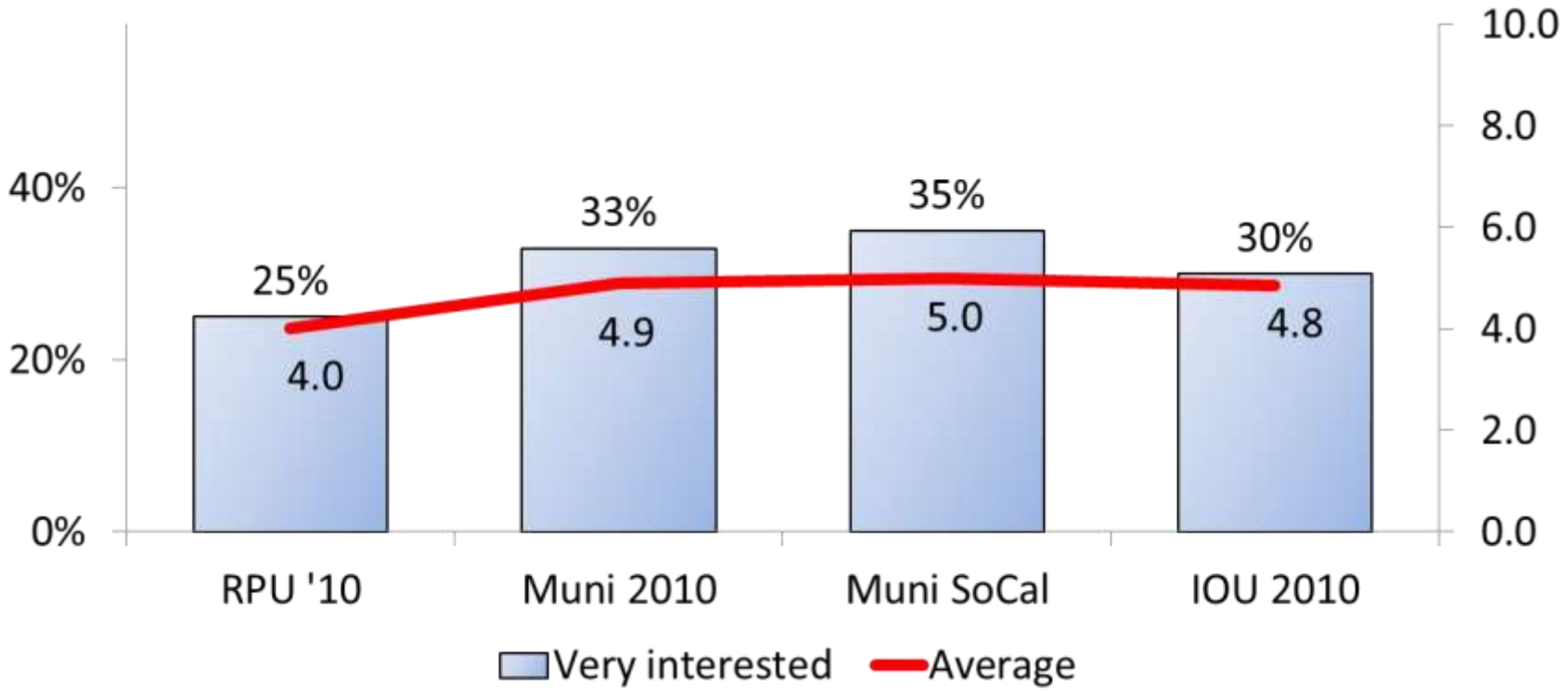
500 charges/mo – Average Rate $/kwh

EV Readiness Program

- **DOE Grant - ARRA to install 11 public electric chargers at 7 city locations**
- **AB2766 Air Quality Funding to cover the installation costs (approx. $50,000)**
- **Chargers will use ChargePoint Network**
- **Chargers are anticipated to be installed this spring**
- **GreenRiverside.com**
  - ➔ EV Information related to RPU
  - ➔ Guidelines for Home Charger Installations

BACK TO THE FUTURE?

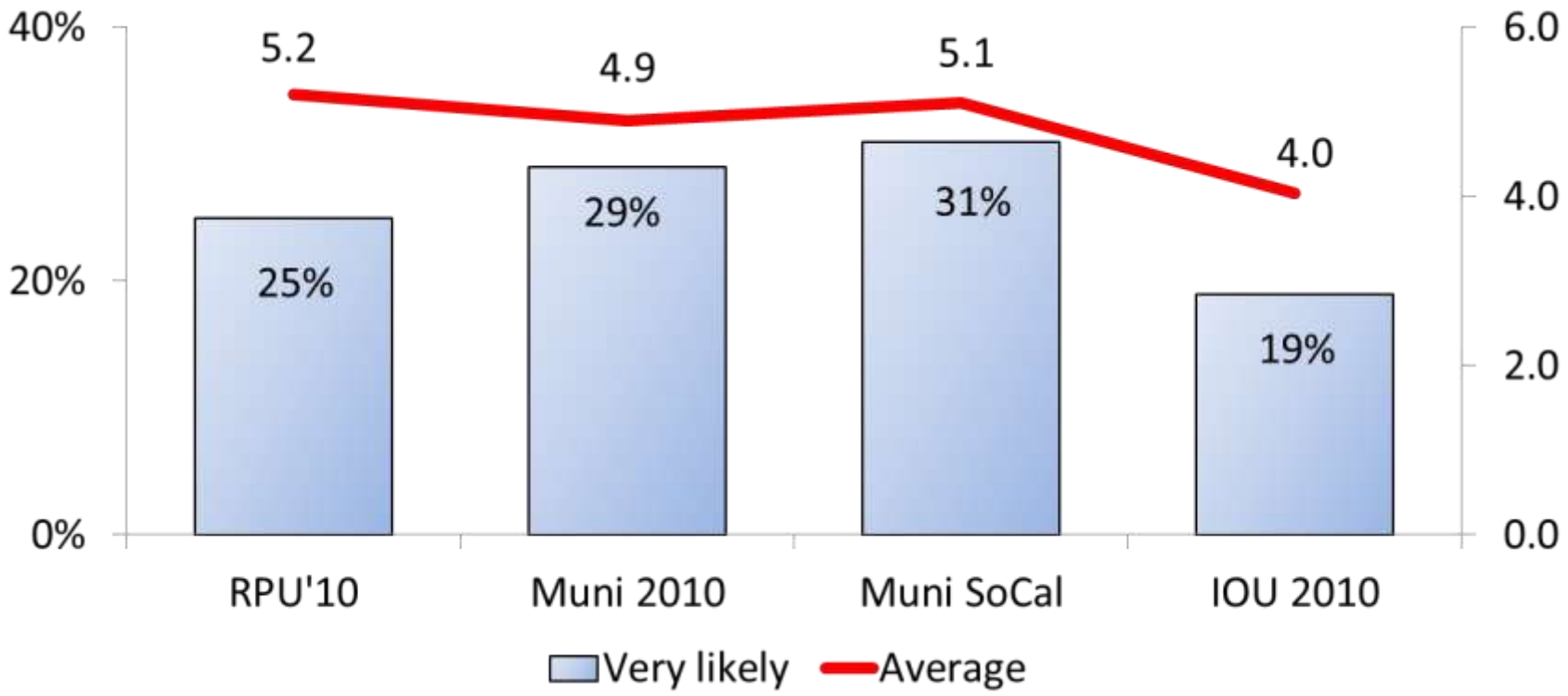
Interest in learning about Plug-in Electric Cars



Base is all customers. (EC-1)

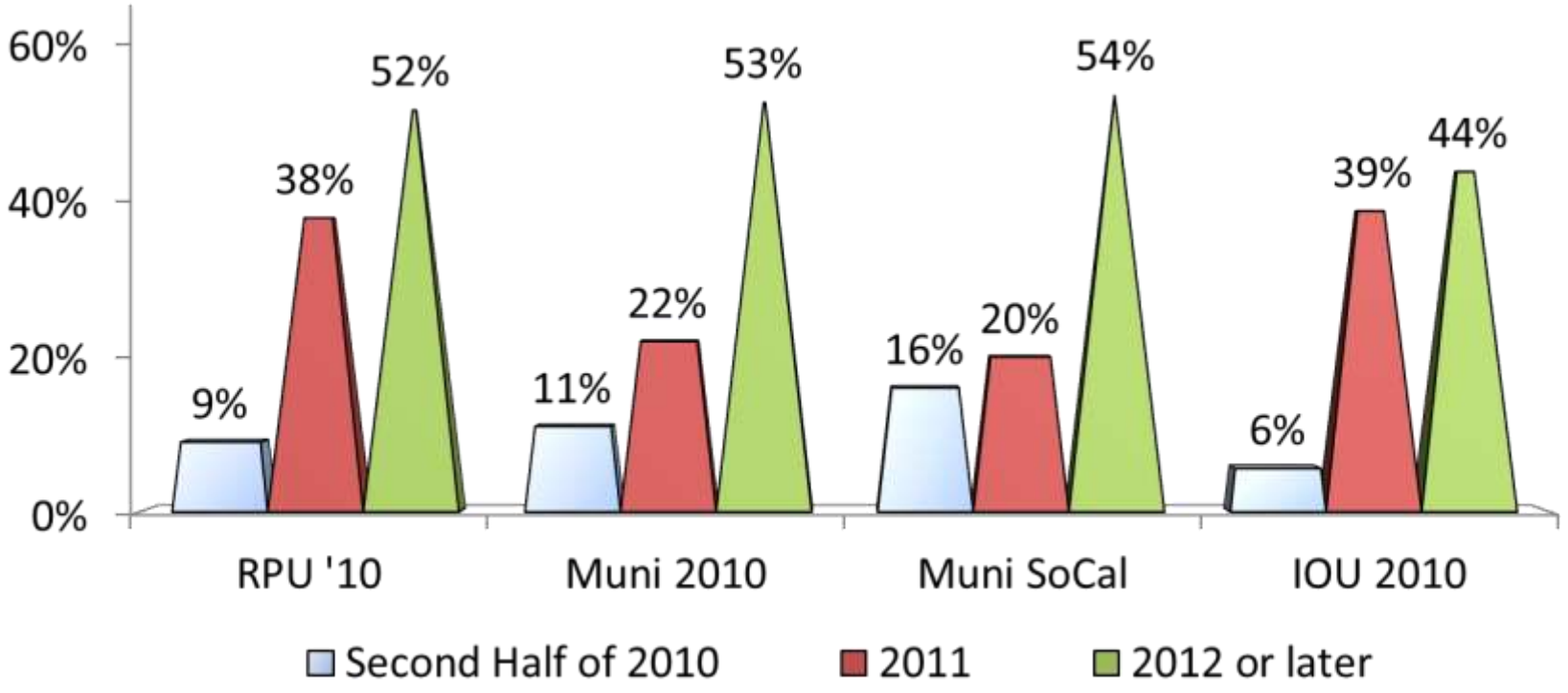
Likelihood of Acquiring Plug-In Electric Cars

(Among those interested in learning about Electric Cars)



Base is customers interested in electric cars from EC-1. (EC-2)

When Likely to Purchase/ Lease Plug-In Electric Car



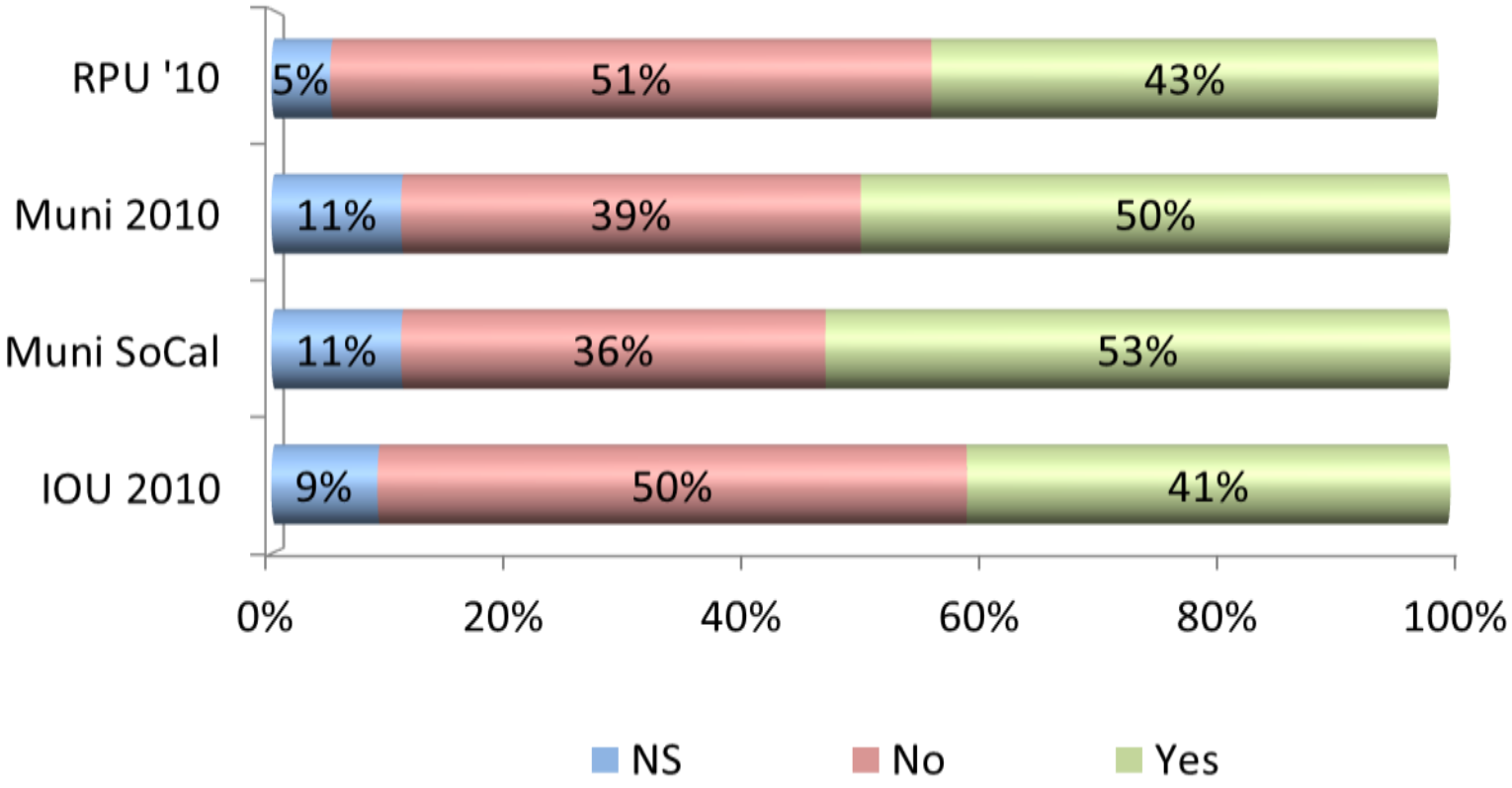
Base is customers interested in electric cars from EC-1.
(EC-3)

Value of Utility Electric Charging Options
(Among all customers)

Electric Car Value Features ***(% responding "very valuable")***	**RPU 2010**	**Muni 2010**	**Muni SoCal**	**IOU 2010**
Utility provides introductory packet of information covering charging basics and safety	22%	30%	33%	31%
Utility tested and approved home charging systems for customers	25%	37%	41%	37%
Utility sets up and runs charging stations at malls or public parking locations	34%	38%	42%	46%

Base is all customers. (EC-4a,4b,4c)

Want New Home to Include Automobile Charger in Garage



Base is all customers. (EC-5)

Conclusions

- Electric cars are a positive result flowing out of this survey: they are clearly grabbing the attention of customers. It appears that it is not just "early adopters" who are interested in EVs.

- There are two aspects of the plug-in electric vehicle phenomenon that offer opportunities for California municipal utilities:
  - Ensuring the distribution system is ready and able to accommodate
  - Encouraging the build-out of the charging infrastructure

Auto Industry Projection:

2020 – 40% of All Car Sales PEV; 10% of All Vehicles