



## Department of Water and Power City of Los Angeles

**DOCKET**

**08-DR-1**

DATE APR 22 2008

RECD. JUL 25 2008



## Advanced Metering Infrastructure / Smart Grid Project

April 22, 2008



## Advanced Metering Infrastructure / Smart Grid Project

# Implementation Strategy

---

- ☐ Open, non-proprietary communications with easily interchangeable components throughout AMI system
- ☐ “Plug and play” – a new device would be able to register itself upon installation and immediately begin to communicate with neighboring systems
- ☐ Minimize impact of communication technology change by installing a scalable RF mesh and IP backbone network using public communication network
- ☐ Provide access to home premises for high energy residential consumers to monitor and control electric load with “off-the-shelf” network devices
- ☐ Design a flexible AMI / Smart Grid foundation for future technology standards, system interfaces, and regulatory requirements



# Advanced Metering Infrastructure / Smart Grid Project

## AMI Five Year Full Implementation Plan

---

### Goals:

- ❑ Infrastructure shall support multiple core functions beyond meter reading, including distribution operations, system reliability, energy efficiency, and customer services, etc.
- ❑ Minimize O&M costs
  - Automate Meter Reading
  - Improve Customer Service
  - Automate Outage Management
- ❑ Improve rate design and analysis capabilities

### Metering Plan:

Implement a flexible AMI plan that can work with any communication medium

- Wireless (Public Network) two way communication meters
  - 25,000 large and medium Commercial and Industrial customers – equipped with TOU, power quality, outage notification, and web presentment functions
  - 64,000 residential customers with monthly energy consumption over 1,200 kWh – equipped with ZigBee protocols to monitor and control home electric devices
  - 10,000 identified high turn over residences – equipped with remote turn on / off functions
  - 2,500 critical care residential customers – equipped with outage notification function
- Walk-by or drive-by (RF) one way communication meters that can be upgraded to fixed network or RF mesh network configurations
  - 180,000 small commercial with RF demand meter
  - 1.1 million residential RF meters
  - 674,000 water ERT modules



# Advanced Metering Infrastructure / Smart Grid Project

## AMI Benefits

---

### Remote Turn-on/off

- o *Research metering technologies to provide turn-on/turn-off remote capability*
- o *Beneficial in high transition and high crime areas*

### Calendar Month Billing for Large Customers

- o *Provide customers billing schedule option consistent with available interval data*
- o *Improve cost management for customers*

### Improve Safety

- o *Install AMR meters in difficult to read areas (i.e. locked yards, dogs, gangs)*

### Special Rates

- o *Enhance ability to provide special rates such as Critical Peak Pricing, Net Metering, and Load Curtailment*

### Improved Customer Services

- o *Provide the Department the ability to detect power outages*
- o *Support Energy Efficiency programs via AMR and web capability*
- o *Support proactive services to our Critical Care Customers*

### Support Energy Efficiency Programs

- o *Provide audit data for all large and medium commercial and industrial customers*
- o *Support home energy management 64,000 residential high energy consumers*



# AMI PROJECT: CURRENT STATUS

---

- ☐ As of 1/01/08, the LADWP has installed 64,181 AMR meters (5.3% of meter population)
  - Residential Meters (F meters) – 37,800
  - Small Commercial Demand Meters (FM meters) – 19,100
  - Large Commercial Wireless Meters (A meters) – 7,281
- ☐ AMR meters represent approximately 5.3% of the total meters in the system but over 35% of the power revenue
- ☐ Small commercial demand meters have increased revenue approximately \$1.3 million per year
- ☐ Wireless meter reading and real-time pricing available for 7,281 Large Commercial Customers with demand greater than 200kW



# AMI PROGRAM: IMPLEMENTATION SUMMARY

Energy Rate	No. of Energy Meters	No. of Water Meters		AMR Scenario	Meter	Notes
A3	1,000			Daily Download, Web Posting	Wireless Energy Meter	Commercial and Industrial, Energy Meter Existing
A3		1,100		Monthly Walk-by	RF Water Meter	Commercial and Industrial Customer
A2	24,000			Daily Download, Web Posting	Wireless Energy Meter	Commercial and Industrial, Cover all A2 customers
A2		4,900		Monthly Walk-by	RF Water Meter	Commercial and Industrial Customer
A1	180,000			Monthly Walk-by	RF Energy Meter	Billboards, currently billed from blended rate that is not in the ordinance
A1		67,000		Monthly Walk-by	RF Water Meter	Commercial and Industrial Customer
R	1,125,000			Monthly Walk-by	RF Energy Meter	Power Residential Customers
R		580,000		Monthly Walk-by	RF Water Meter	Water Residential Customers
R	65,000			Energy Management	Wireless Energy Meter	Residential Customers > 1200kWh
R	10,000			Remote Turn On/Off, Monthly Walk-by	Wireless Energy Meter	Apartments, install in high turnover areas
R	2,500			Outage Management	Wireless Energy Meter	Critical Care (Power Outage Notification)



# AMI PROGRAM: INSTALLATION PLAN

## 5 Year Accelerated Plan

	FY 06/07	FY 07/08	FY08/09	FY 09/10	FY 10/11	FY 11/12	FY 12/13	FY 13/14	FY 14/15	FY 15/16	FY 16/17	TOTAL
<b>WATER METERS</b>												
Small - 1 inch	800	30,000	110,000	110,000	110,000	110,000	110,000	-	-	-	-	580,800
Medium - 1.5 inch	200	400	8,820	8,820	8,820	8,820	8,820	-	-	-	-	44,700
Medium - 2 inch	200	400	5,070	5,070	5,070	5,070	5,070	-	-	-	-	25,950
Large - 3 inch to 6 inch	100	200	3,790	3,790	3,790	3,790	3,790	-	-	-	-	19,250
Extra Large - 8 inch to 16 inch	10	20	670	670	670	670	670	-	-	-	-	3,380
<b>TOTAL WATER METER INSTALLED</b>	<b>1,310</b>	<b>31,020</b>	<b>128,350</b>	<b>128,350</b>	<b>128,350</b>	<b>128,350</b>	<b>128,350</b>	-	-	-	-	<b>674,080</b>
<b>ENERGY METERS</b>												
C&I Wireless	2,400	3,600	4,000	4,000	4,000	4,000	4,000	-	-	-	-	26,000
C&I RF 3-phase	1,500	2,000	40,000	15,000	-	-	-	-	-	-	-	58,500
C&I RF 1-phase	13,000	14,000	85,000	25,000	-	-	-	-	-	-	-	137,000
Residential RF	5,000	5,000	5,000	200,000	310,000	310,000	310,000	-	-	-	-	1,145,000
Residential Wireless	-	-	3,000	16,000	16,000	16,000	16,000	-	-	-	-	67,000
Remote Disconnect Wireless	-	-	-	2,500	2,500	2,500	2,500	-	-	-	-	10,000
Special Metering	-	-	-	-	-	-	-	-	-	-	-	-
<b>TOTAL ENERGY METERS INSTALLED</b>	<b>21,900</b>	<b>24,600</b>	<b>137,000</b>	<b>262,500</b>	<b>332,500</b>	<b>332,500</b>	<b>332,500</b>	-	-	-	-	<b>1,443,500</b>



# AMI PROGRAM: LABOR REQUIREMENTS – 5 YEARS

---

## Required Labor Force To Install 2.1 Million AMI Meters

- 44 Water ERT Module Installers
  - ❑ 580,000 <1" water ERT meter installations
  - ❑ 94,000 >1" water ERT meter installation
  
- 170 (60 budgeted) Power Meter Installers
  - ❑ 24,000 A3 and A2 energy meter installations
  - ❑ 160,000 A1 energy meter installations
  - ❑ 1,200,000 Residential energy meter installations





# **AMI PROGRAM:**

## **BUSINESS CASE**

---

### **Summary: 4 years after project completion**

- ☐ Total Cost Savings or Reduction: \$670,755
- ☐ Project Capital Cost: \$415,935
- ☐ O&M Costs: \$28,371
- ☐ Discounted Payback: 4 years
- ☐ Net Present Value (NPV): \$63,623

**Discount Rate at 9%**  
**Dollars in 000's**



# AMI PROGRAM: OPPORTUNITIES

---

- ☐ With the new Rate Analysis System, large commercial customers with wireless meters could be billed directly.
- ☐ Customers could be offered calendar month billing and customized bills sent electronically.
- ☐ Gas Company is installing 100k meters in the LA area and would like to coordinate with LADWP.
- ☐ WIFI – Pilot Project to install WIFI meters in conjunction with the Mayor's wireless plan for the City of Los Angeles
- ☐ Net Metering – Install wireless meters for Solar Installations to provide customers billing with more detailed information such as energy generated, energy used and value of energy generated
- ☐ Outage notification for 2,500 critical care residential customers and 1,000 large commercial and industrial customers

