

Smart Grid Economic and Environmental Benefits

NASUCA

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What Benefits Do Customers Receive?

1. Significant Dollar Savings: \$154/year
2. Measured at Societal Level
3. Is there a way Utilities Can Share Benefits?

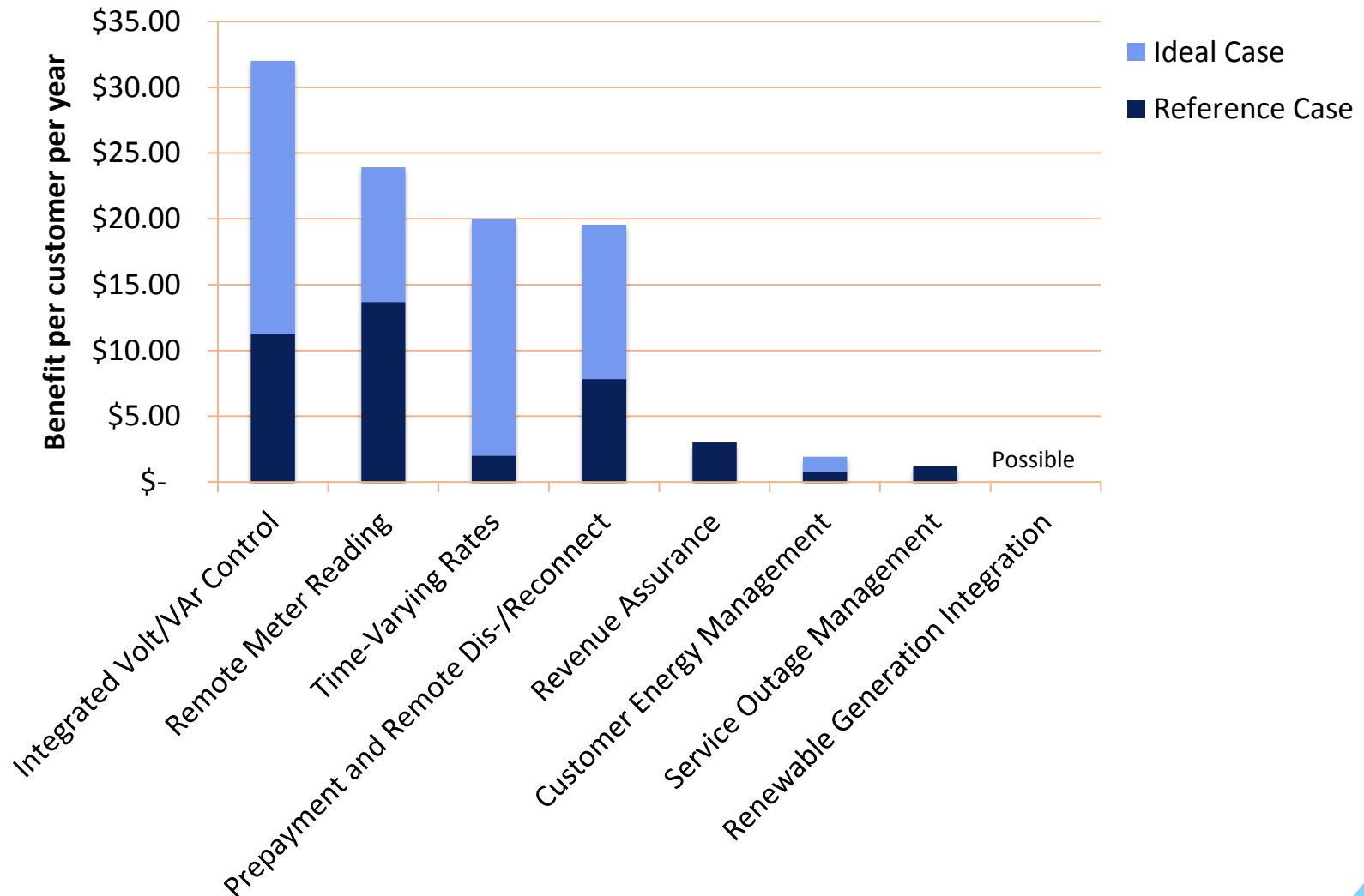
— If they Take Risks?

Investments Improve Smart Grid Capabilities

1. Integrated Volt/VAr Control
2. Remote Meter Reading
3. Time-Varying Rates
4. Prepayment and Remote Dis-/Reconnect
5. Revenue Assurance
6. Customer Energy Management
7. Service Outage Management
8. Fault Location and Isolation
9. Renewable Generation Integration

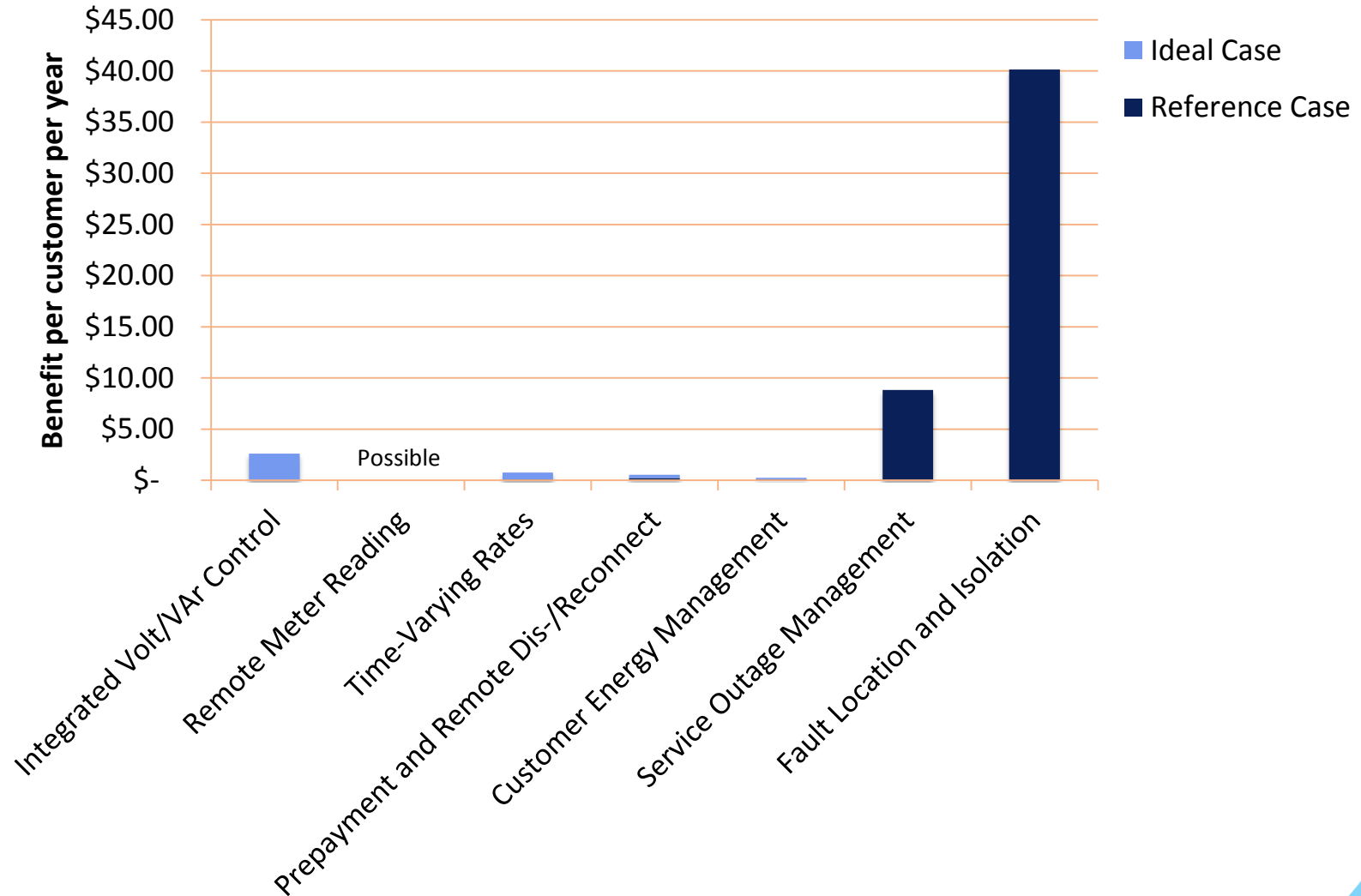
What Are the Direct Economic Benefits?

Total direct benefits from Smart Grid are \$39.69-101.57 per customer per year



What are the Indirect Economic Benefits?

Total indirect benefits from Smart Grid are \$49.67-53.08 per customer per year



How is Reliability Improved?

Capability	Reliability Improvement	
	(%)	(customer-minutes)
Integrated Volt/VAr Control	Improved power quality (not quantified)	
Service Outage Management	4.5%	4.9 minutes
Fault Location and Isolation	20.5%	22.3 minutes
Renewable Generation Integration	Likely	

The Big Number: \$154 per Year!

Capability	Direct Economic Benefits	Reliability Improvement	CO ₂ Equivalent Reduction ³	Indirect Economic Benefits ⁴	Customer Choice Benefits
Integrated Volt/ VAR Control	\$11.24–32.01	Improved power quality (value not quantified)	Likely – 372 lbs.	Likely – \$2.59	
Remote Meter Reading	\$13.68–23.92		Possible	Possible	
Time-Varying Rates	\$2.00–19.98		11–110 lbs.	\$0.08–0.76	Yes
Prepayment and Remote Dis-/Reconnect	\$7.82–19.56		30–76 lbs.	\$0.21-0.53	Yes
Revenue Assurance	\$3.00				
Customer Energy Mgmt.	\$0.77–1.92		14–34 lbs.	\$0.10–0.24	Yes
Service Outage Management	\$1.18	4.5% 4.9 minutes		\$8.82	
Fault Location and Isolation		20.5% 22.3 minutes		\$40.14	
Renewable Generation Integration	Possible	Likely	Likely		Yes
REFERENCE CASE TOTALS	\$39.69–101.57	25% 27.2 minutes	55–592 lbs.	\$49.67–53.08	Yes

How Are Benefits Maximized?

Four variables drive the available Smart Grid benefits found in this research:

1. Utility Operating Characteristics
2. Customer Participation and Behavior
3. Speed of Cost Reduction and Recognition
4. Market Prices for Electricity and Capacity

Conclusions and Recommendations

1. Focus on customer engagement
2. Take a systems approach to maximize benefits
 - A. Utility Operations
 - B. Customer Engagement
 - C. Regulatory/Governance
3. Stakeholders collaboration is essential to define desired outcomes and optimize benefit drivers
4. Some Smart Grid capabilities require more research

Question:

Can Regulators adopt/approve

- Programs
- Policies
- Utility projects

So customers can get these benefits?