Sean Maloney

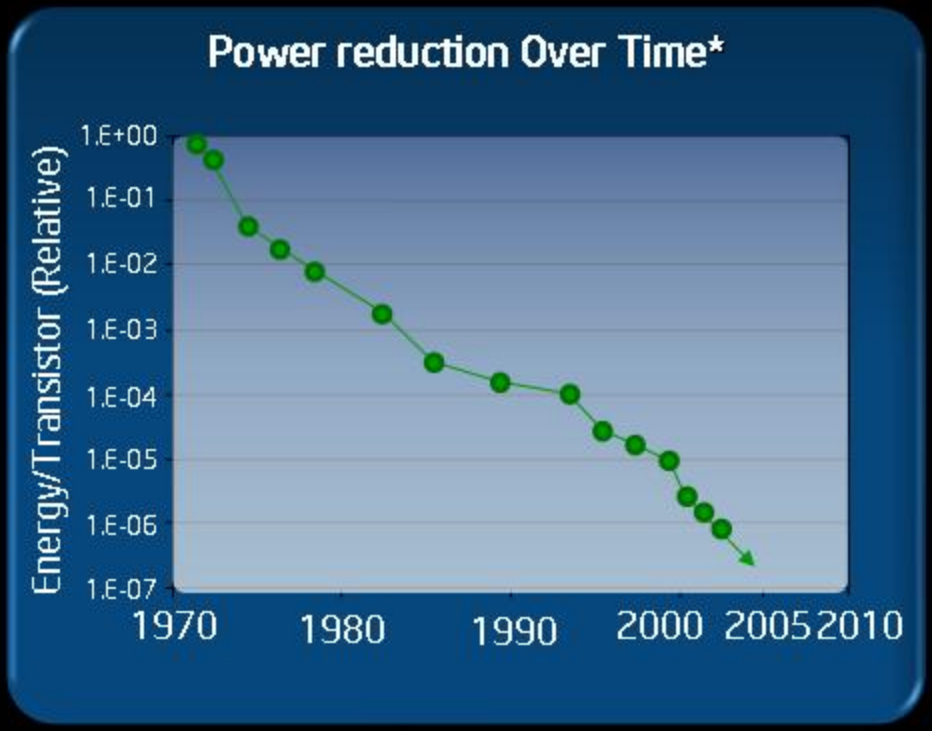
Executive Vice President
Chief Sales and Marketing Officer

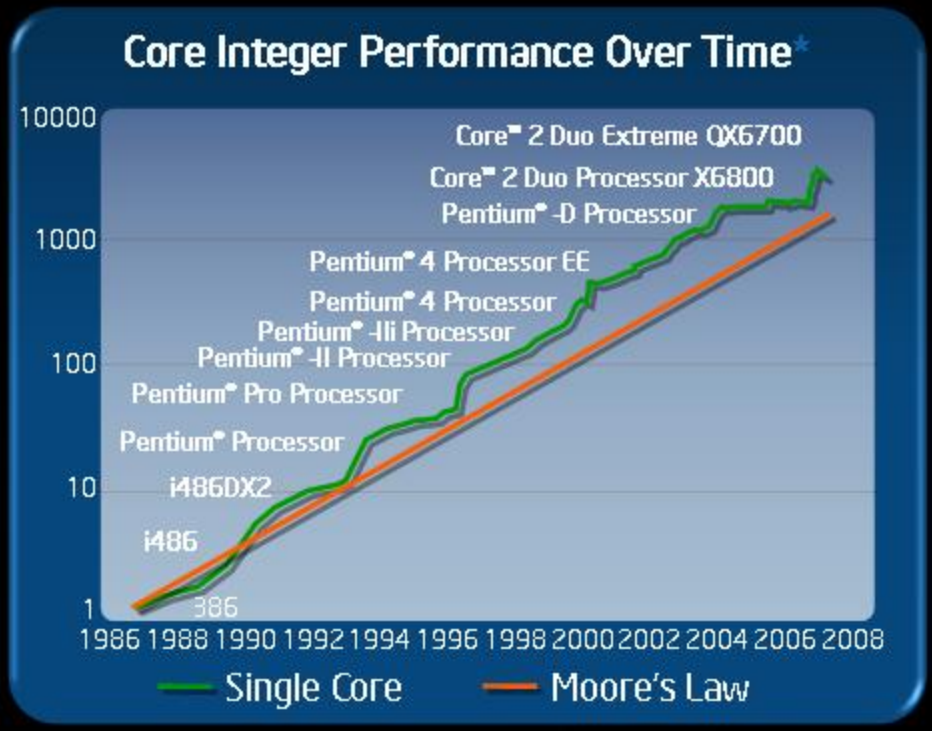
Intel Capital Cleantech Investments in 2008

- **Solar Energy Technology**
  - SpectraWatt
  - Sulfurcell
  - Voltaix
  - Trony Solar
- **Smart Electricity Grid**
  - Grid Net
  - Applied Green Light
- **Advanced Energy Storage**
  - Net Power Holdings
  - Cymbet

*Other brands may be claimed as the property of others.

Power Reduction is Our Core Competence





~ 1 Million Factor Reduction In
Energy per Transistor Over 30+ Years Delivering

Source: Intel Corporate Technology Group

An Unprecedented Challenge

Globale_Abkühlung
地球寒冷化
Raffreddamento globale
גלאבאלע אפקילונג
Enfriamento global
Global Cooling
Ilmaston viileneminen
Глобальное похолодание
全球寒冷化
Global uppvärmning
Esfriamento global
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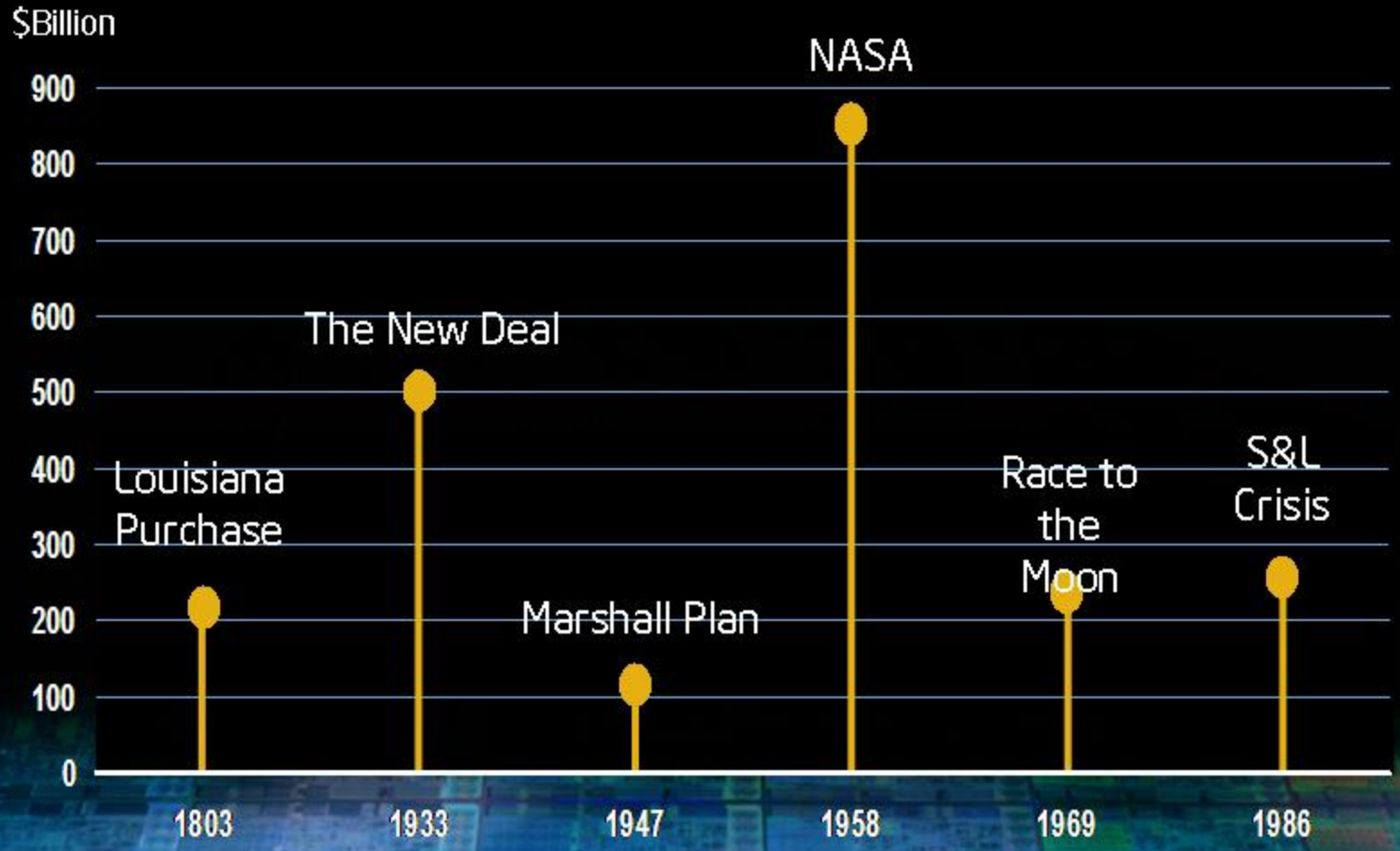
Government Spending
Largest Projects In History (Inflation Adjusted)



Government Spending
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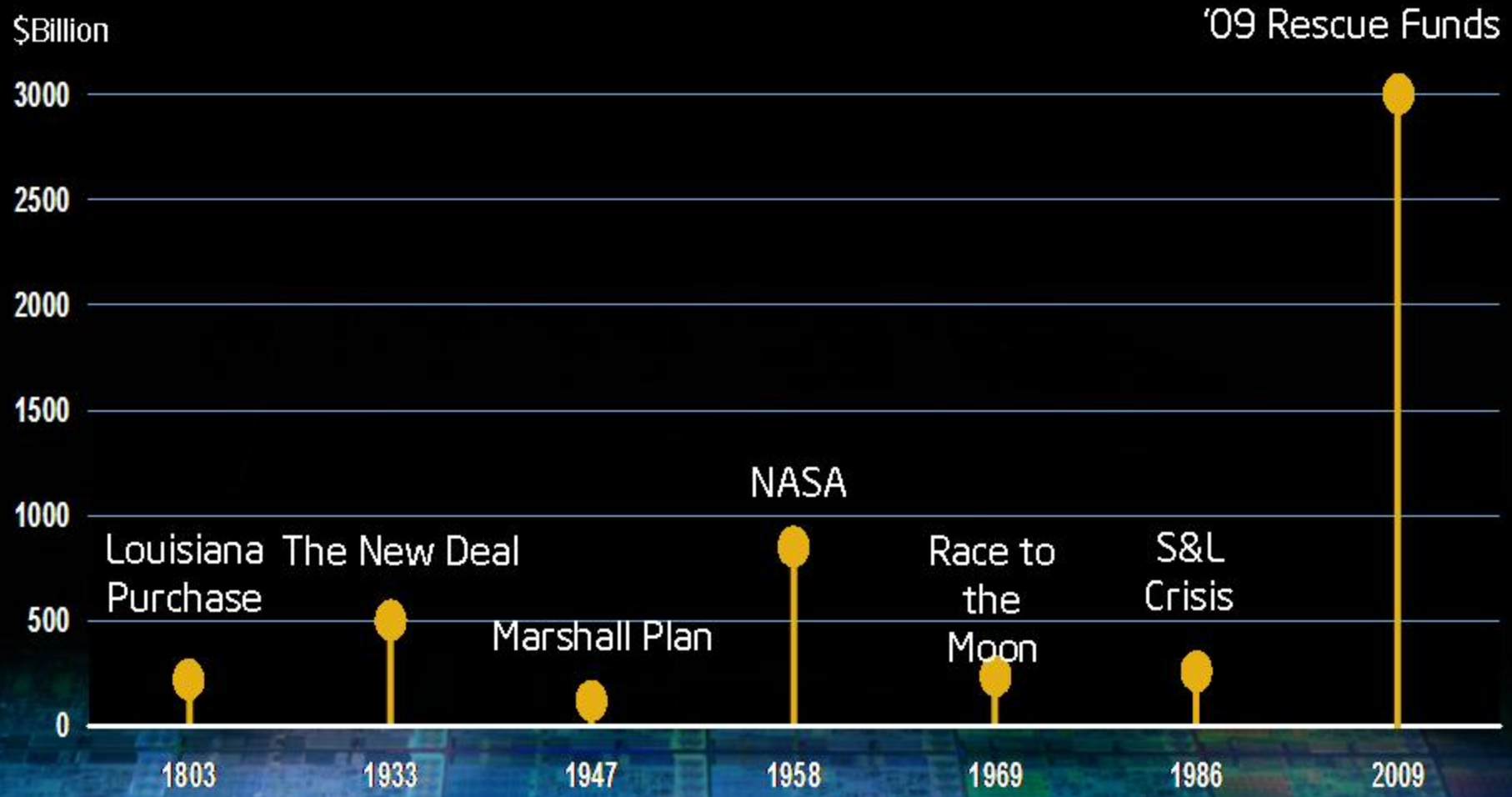


$3T+
intel

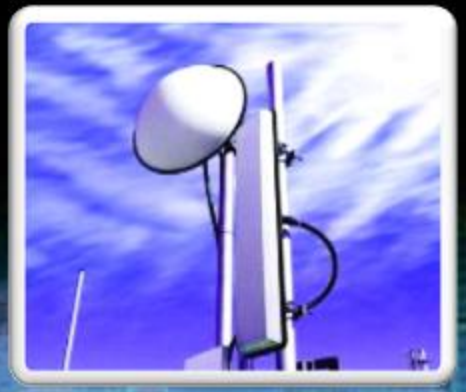
Spend Smart or Spend Dumb

Manufacturing

Construction

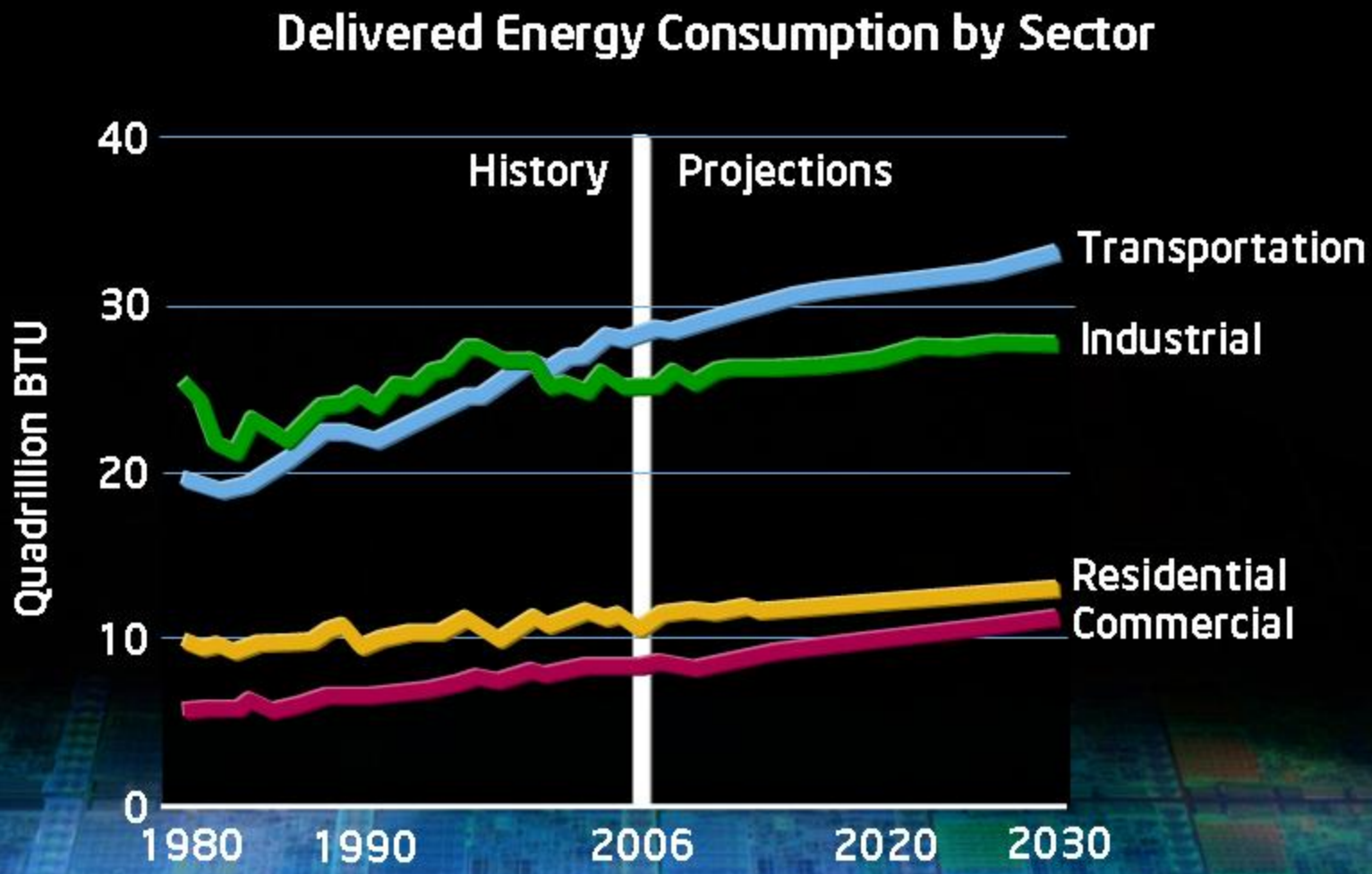
Transportation

Broadband



Energy

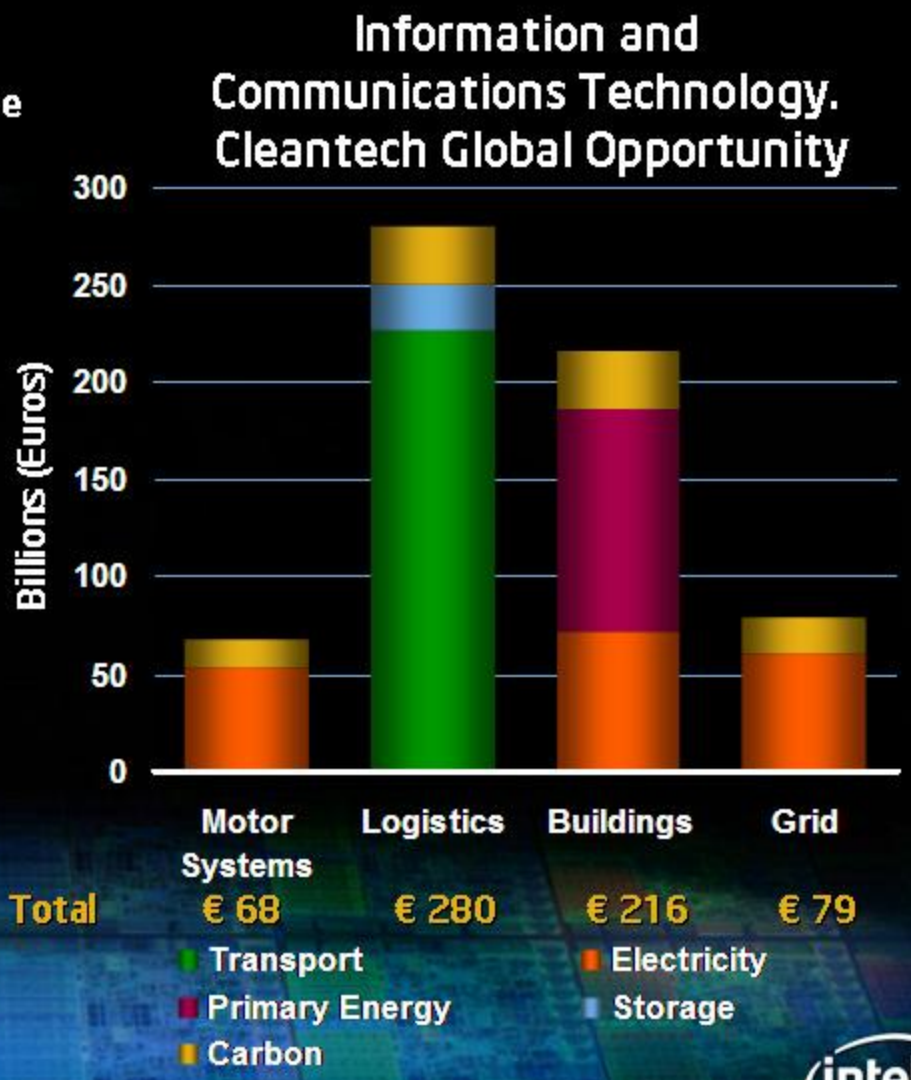
The Most Energy Intensive Sectors...



Source: EIA Annual Energy Outlook 2008

… Have Been the Least [Smart] IT-intensive

Company Segment	Percentage of Revenue Spent on IT
Media	8.2%
Professional Services	6.9%
Information Technology	6.9%
Financial Services	5.9%
Electronics	5.6%
Banking	5.6%
Pharmaceuticals	5.5%
Health Care	4.6%
Cross Industry	4.5%
Construction & Engineering	4.4%
Transportation	3.9%



Source: Gartner Consulting (July 2005), Smart 2020 report

SMARTer Manufacturing: 3D Simulation
Test and Refine the Product Before It's Real

Simulation

Analysis

Top performing manufacturers:

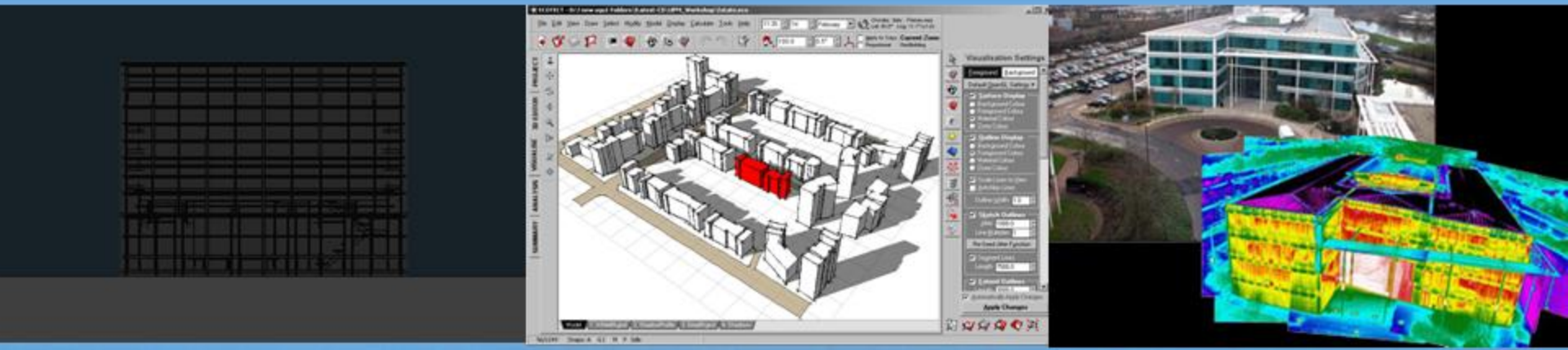
- Build ½ the number of physical prototypes
- Get product to market 58 days faster
- Have 48% lower prototyping costs

3D simulation a big untapped opportunity

Source: Aberdeen group

Construction: 3D Simulation
Building Information Management / Green

- US Buildings: 71% of total electricity consumption
  - Also 39% of energy consumption, 39% CO2 emissions, 36% of Greenhouse gases
- 3D is the big untapped opportunity



What is the world's largest annual movement of People.

Saudia Arabia, Mecca:
The Hajj = 3 Million People

United States:
Thanksgiving: 11 Million Travelers

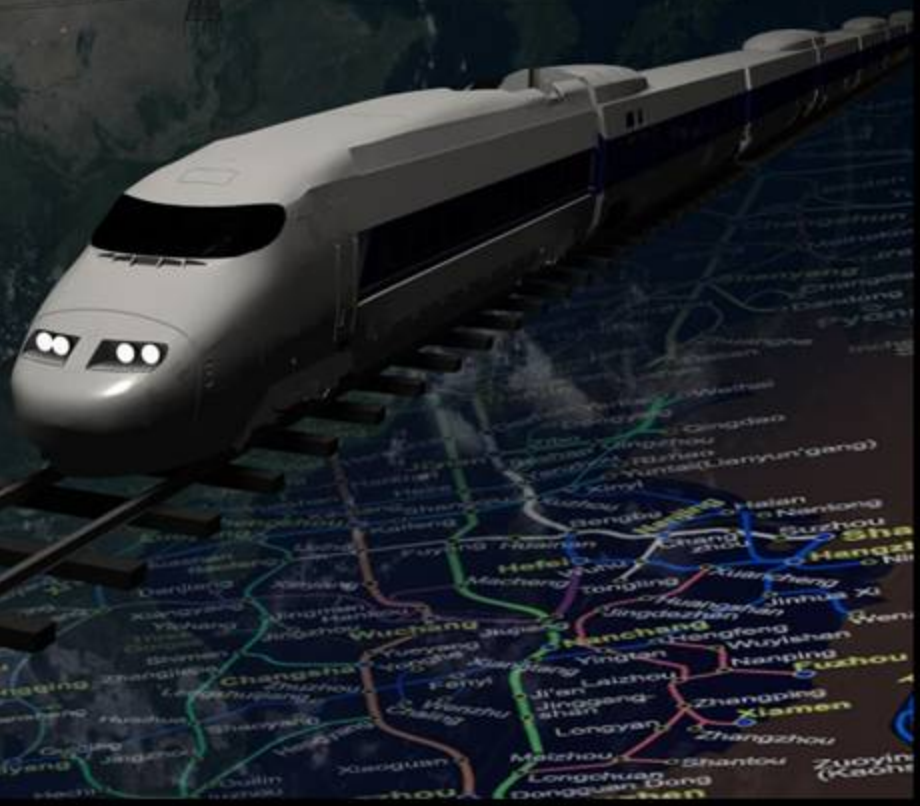
China
Chunyun = 196 Million Passengers

China Railroads
• $330 Billion Investment 2009-2011
• 3.2B Passengers in 2012
• 63,000 Train Cars (3500 new trains x 18 cars)*
• 25,600 miles of high speed track
under construction
(greater than circumference of earth)
• 6000 total stations built
• 150,000 mobile workers
* Intel estimate

China Railroads

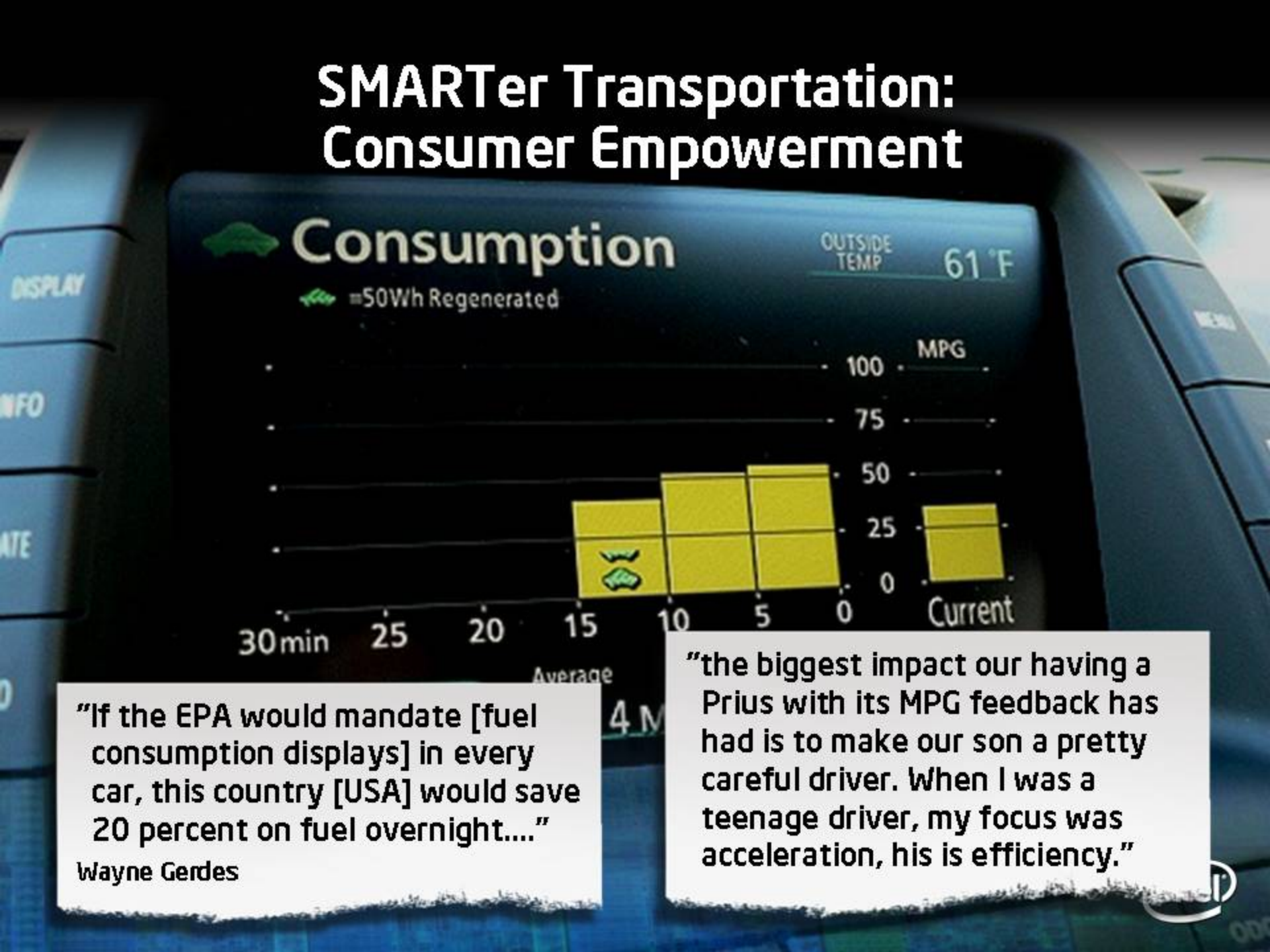
Energy savings per km
(trains instead of cars)
Chunyun: 62.8 billion BTUs
Thanksgiving: 3.5 billion BTUs
Hajj: .96 billion BTUs

Carbon footprint decrease per kilometer
(trains instead of cars)
Chunyun: 29k tons
Thanksgiving: 1.6k tons
Hajj: 444 tons"



* Intel estimate

SMARTer Transportation: Consumer Empowerment



"If the EPA would mandate [fuel consumption displays] in every car, this country [USA] would save 20 percent on fuel overnight...."

Wayne Gerdes

"the biggest impact our having a Prius with its MPG feedback has had is to make our son a pretty careful driver. When I was a teenage driver, my focus was acceleration, his is efficiency."

Next Steps On SMARTer Transportation

- All relevant technology already exists
- In-vehicle technology has been extensively tested
- Communications equipment is available from many equipment suppliers
- The communication capability is waiting for government initiatives

Government Action On Regulation Required, It Needs to be a Priority

SMARTer Connectivity: Broadband

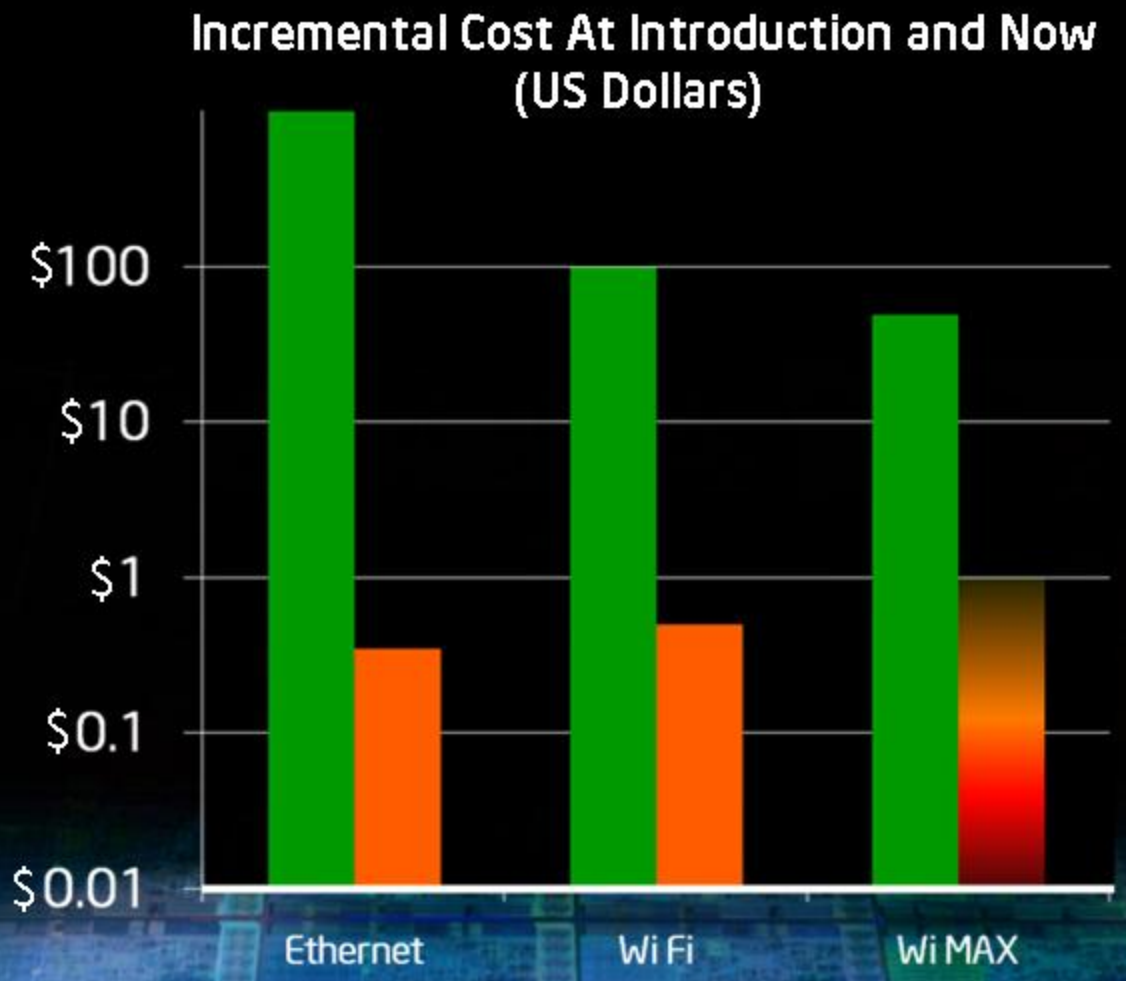
21st Century Infrastructure for Everyone

7% increment (US) → $134B in Economic impact
2.35 million jobs created/saved
3.2 billion lbs of CO_2 / year

400 Million have it. 4B need it

Source: Connected Nation, EIU

Driving Down Cost and Crossing the Digital Divide



WiMAX Signal On Track To Reach 1 Billion People By 2012

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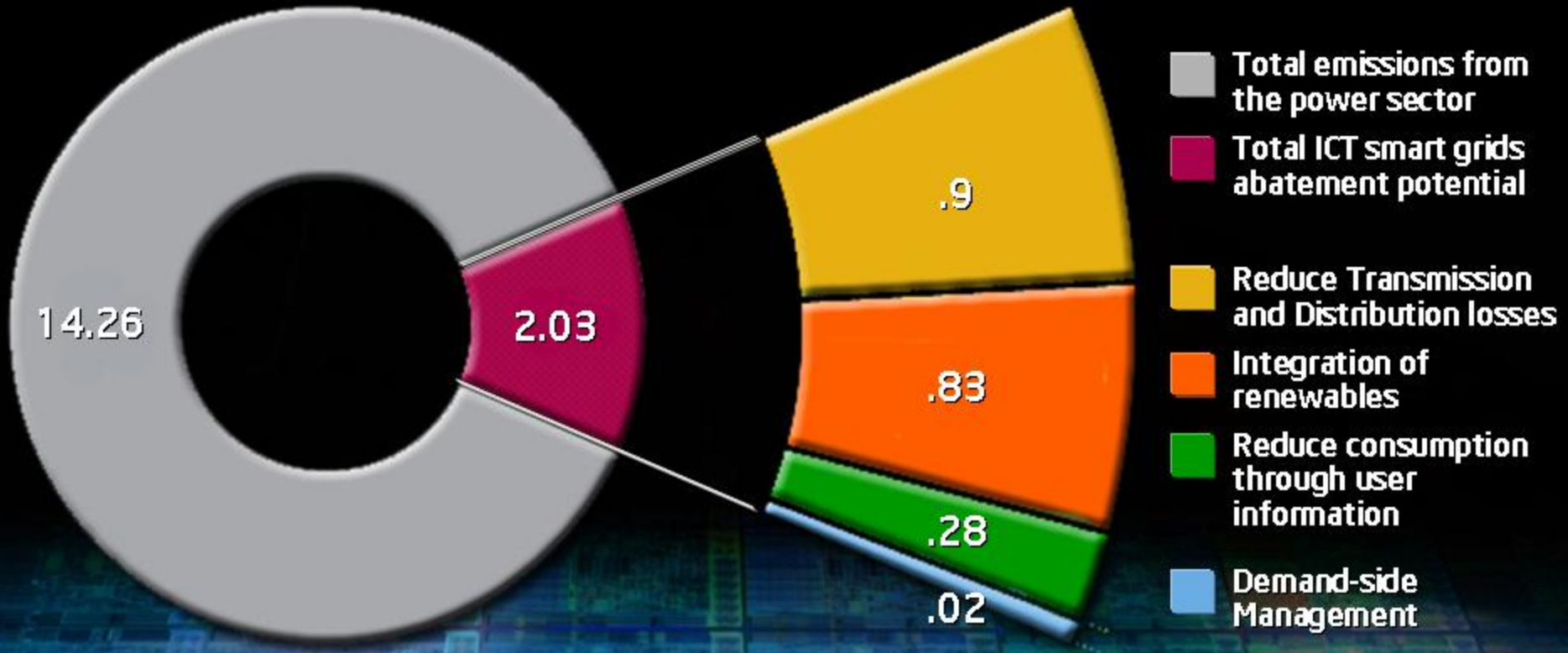
What About Smart Energy?

Potential for Information & Communication Technologies to Reduce Carbon Emissions Through SMARTgrid



Global Emissions Business-as-Usual in 2020=51.9 GigaTons of CO_2 equivalents

Source: Smart 2020 report

intel

SMARTer Grids: The Role of ICT

Standardize, Monitor & Account

Rethink

Transform

Source: Smart 2020 report

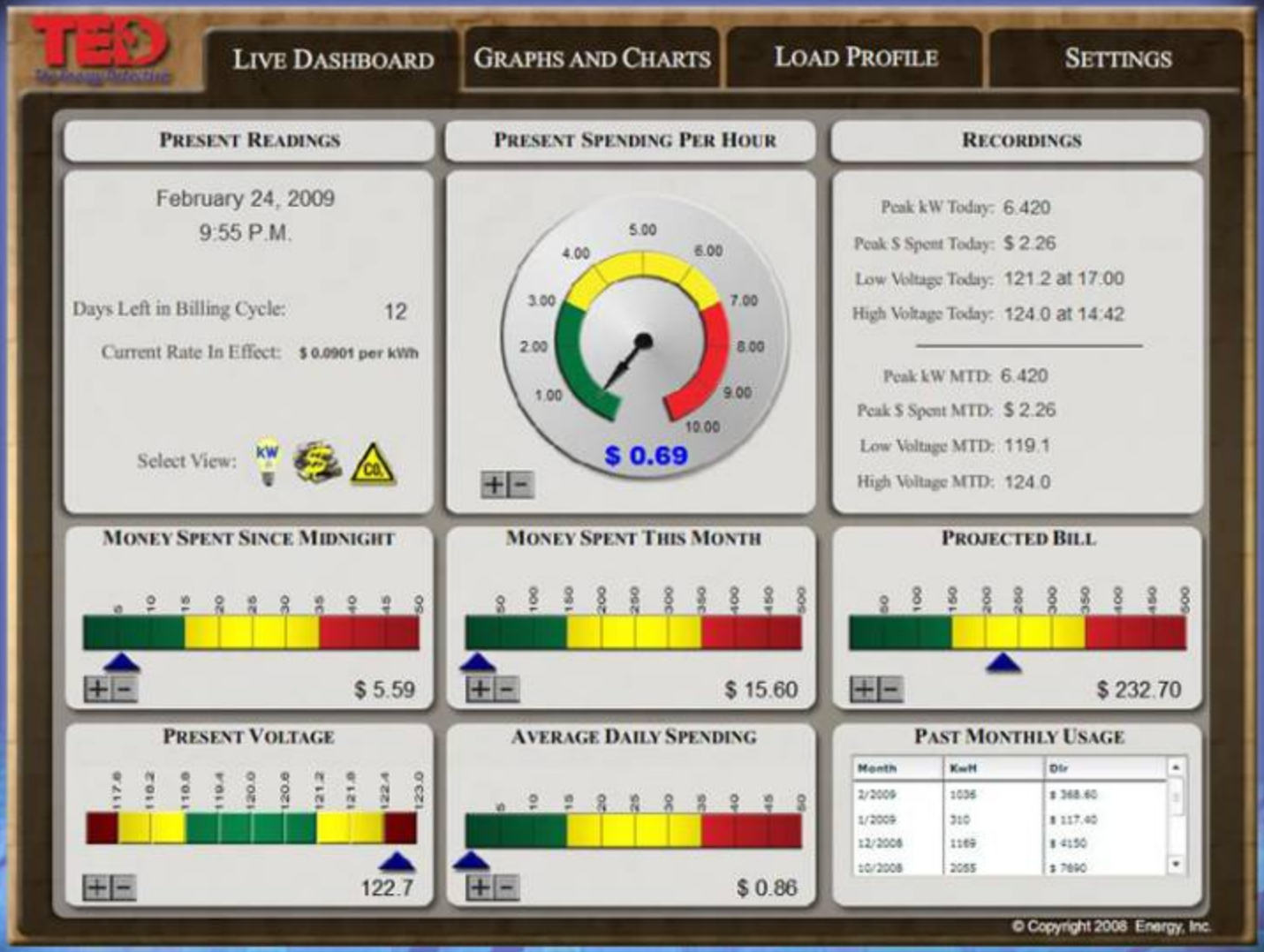
Money Alone Will Not Solve the Problem...
It Will Require Effective National Policy Leadership

Apply Best Practices for
Enabling Competition & Innovation

Open Interfaces & Defined Protocols

Examples:
Building Energy Measurement & Management
Meter Communication
Renewable Integration Modeling

Consumer Empowerment



Going Forward: Monitoring From TV

Intel is a Leader In Renewable Energy

Intel receives Green Power Leadership Award from EPA:

- Largest corporate purchaser of renewable energy in the U.S.
- ~47% of Intel's US purchased electricity comes from renewable sources

Intel site solar installations expanding quickly:

- Bangalore - solar water heaters now saving 70,000 kilowatt hours per year
- Oregon – office building electricity
- New Mexico - solar demonstration on benefits in data centers

* Other names and brands may be claimed as the property of others.

Optimism Is A Pre-requisite For Technology Innovation

The Recession Puts Clean and Smart Center Stage

It Is A Requirement, Not An Option

cleantech®
GROUP LLC