



B&T Solutions-HUB Energy Technology Solutions

Fuel Cells | Renewable Energy | M2M solution for Energy Utilities

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- Fuel Cells Offerings
- Solar PV Offerings
- M2M Service Offerings for Utilities



B&T Solutions-HUB Innovation Exchange

Technologies, Solutions, Processes, Products

Energy Technology & Solutions Focus



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Energy Technology Solutions Focus

▪ The Environment:

The demand for “Power” follows the growth in the world population and the rapid development of emerging economies. This demand is strong and will increase further.

▪ Challenges:

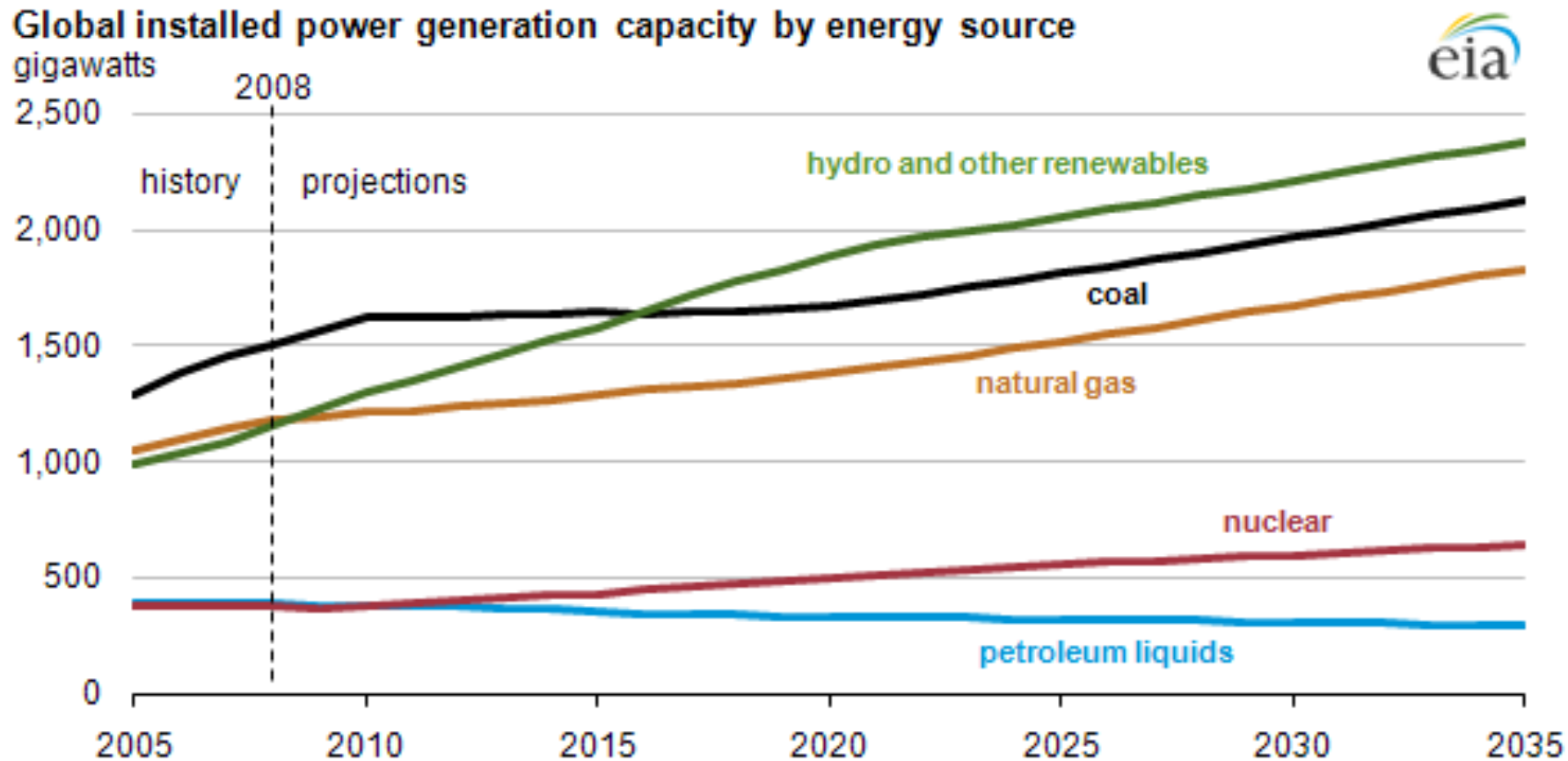
Significant Environmental damage caused by the conversion of “Fossil Fuel” to “Power / Energy” and accelerated “Climate Change” which in turn has a negative effect on the “Quality of Life”

▪ The Way Forward:

Innovative Technology Solutions (Renewable Energy Sources) to increase the “Power Generation Capacity”, efficient “Energy Distribution” systems (Smart Grid) and Distributed Low Carbon Foot Print plants (Energy Cell) are key to meet the demand supply gap

*B&T Solutions-HUB’s Energy Technology & Solutions Offerings would focus on **Renewable Energy, Low Carbon Foot print Plants** and Supporting Systems, Processes and Technologies*

Global Energy Market: Renewable energy showing strongest growth in global energy generating capacity



Source: U.S. Energy Information Administration, International Energy Outlook 2011



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Technologies, Solutions, Processes, Products

Fuel Cell Offerings



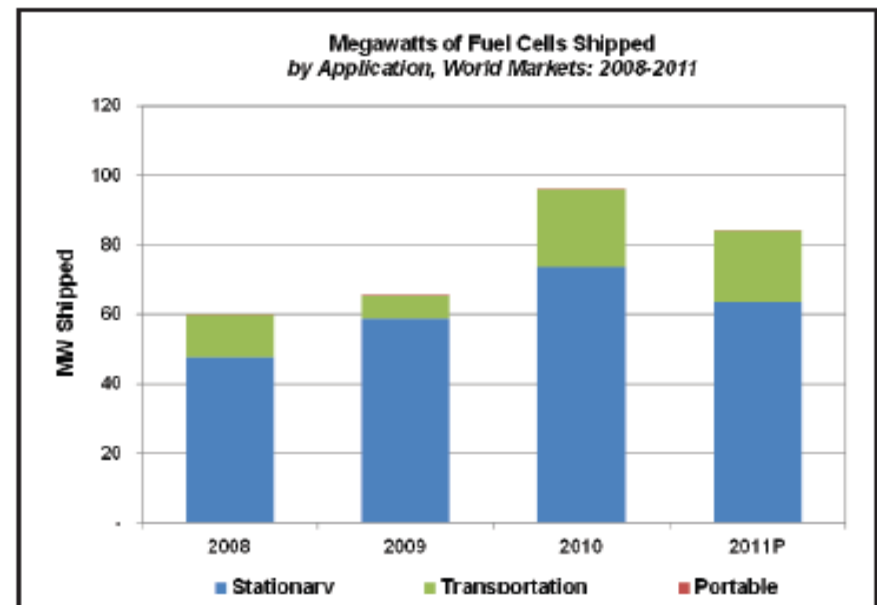
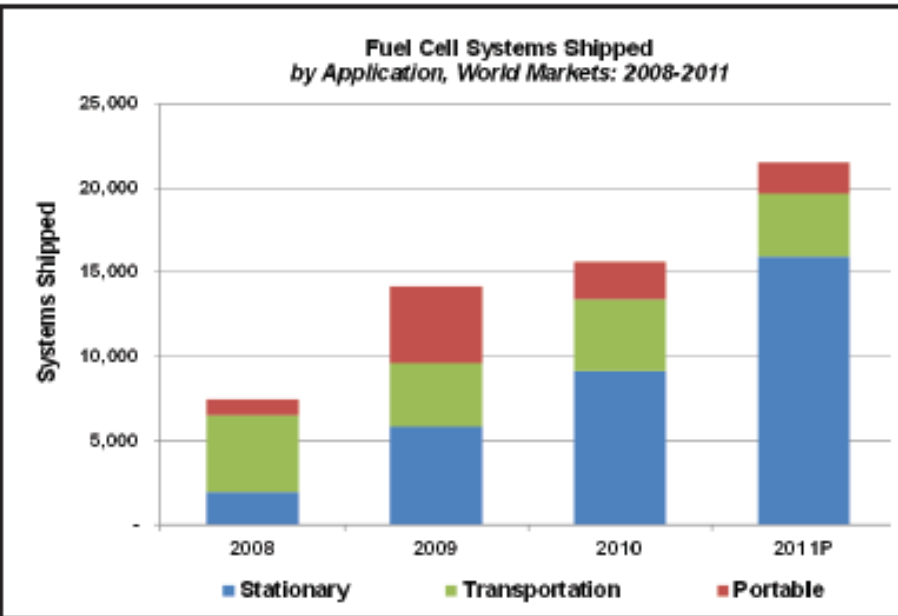
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Fuel Cells – An Introduction

- Fuel cells are electrochemical devices that combine hydrogen and oxygen to produce electricity, water, and heat. Unlike batteries, fuel cells continuously generate electricity, as long as a source of fuel is supplied.
- Fuel cells do not burn fuel, making the process quiet, pollution-free and two to three times more efficient than combustion.
- There are three main markets for fuel cell technology:
 - Stationary power: Stationary power includes any application in which the fuel cells are operated at a fixed location, either for primary or for backup power, or for combined heat and power (CHP).
 - Transportation power: Transportation applications include motive power for cars, buses, and other fuel cell electric vehicles (FCEV), specialty vehicles, materials handling vehicles (e.g. forklifts) and auxiliary power units (APUs) for highway and off-road vehicles.
 - Portable power. Portable power applications use fuel cells that are not permanently installed or fuel cells in a portable device

Fuel Cells – Global Shipments have shown a strong growth



Source: Pike Research

A significant trend emerging globally is the focus on cost reduction and making fuel cell competitive to other clean energy options..

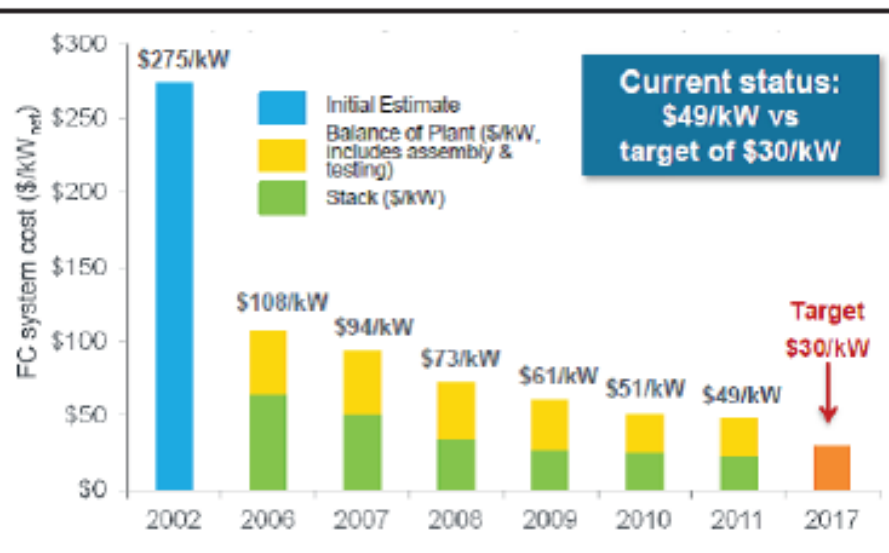


Figure 1: Projected Fuel Cell Transportation System Costs per kW, Assuming High Volume Production (500,000 units per year). Source: DOE

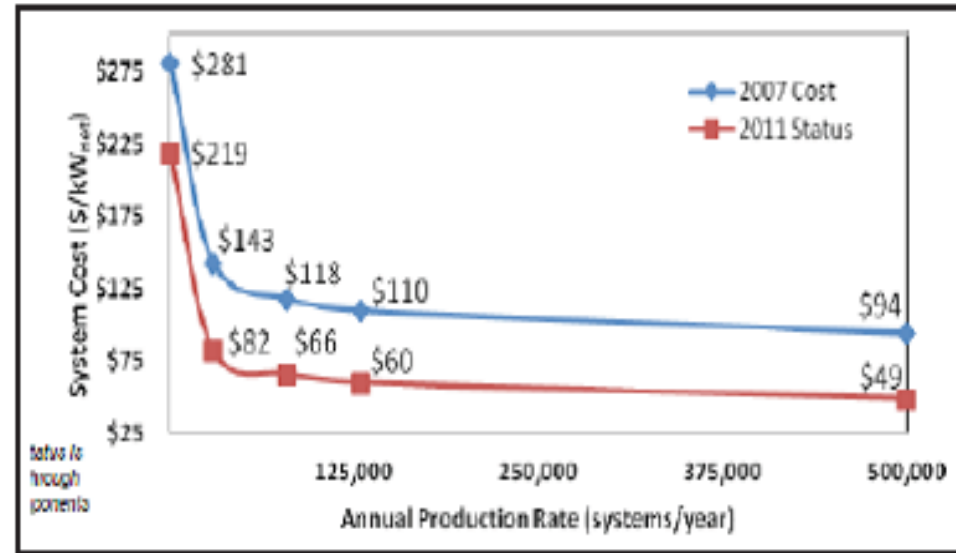


Figure 2: Projected Fuel Cell Transportation System Costs per kW Across a Range of Manufacturing Volumes, 2007 and 2011. Source: DOE

Source: Pike Research

Fuel Cell Solution Offering

- B&T Solutions-HUB, Fuel Cell Focused Solution Offering, for companies seeking to Install Fuel Cell Power Plants, includes:
 1. Project Feasibility
 2. Technical due diligence
 3. Site selection and Project Scoping
 4. Selection of Partners
 5. Project Financing
 6. Project Execution
 7. Project Management (From Concept to Commissioning)



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Technologies, Solutions, Processes, Products

Solar PV Offering



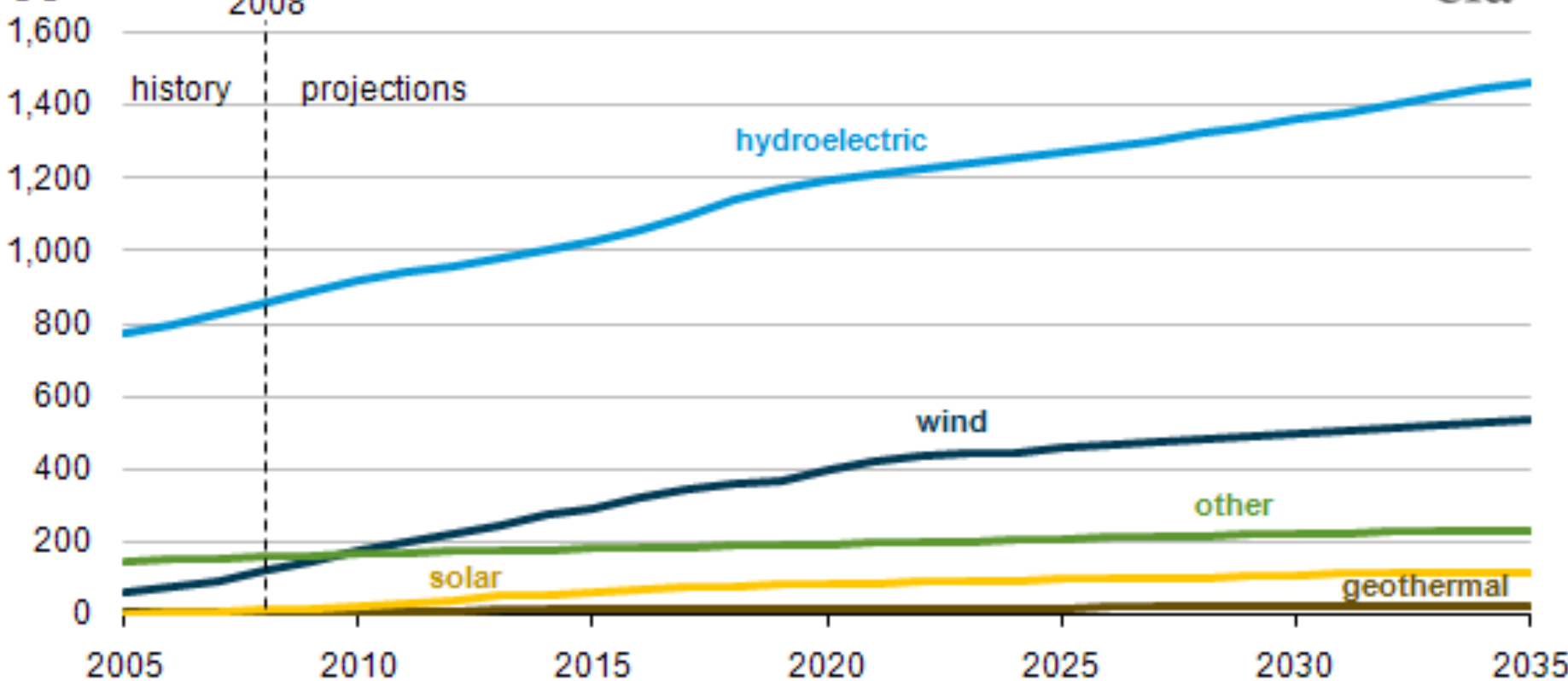
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Solar Energy - sees the largest growth rate over the projected period of 8.3% per year

Global installed power generation capacity by renewable source

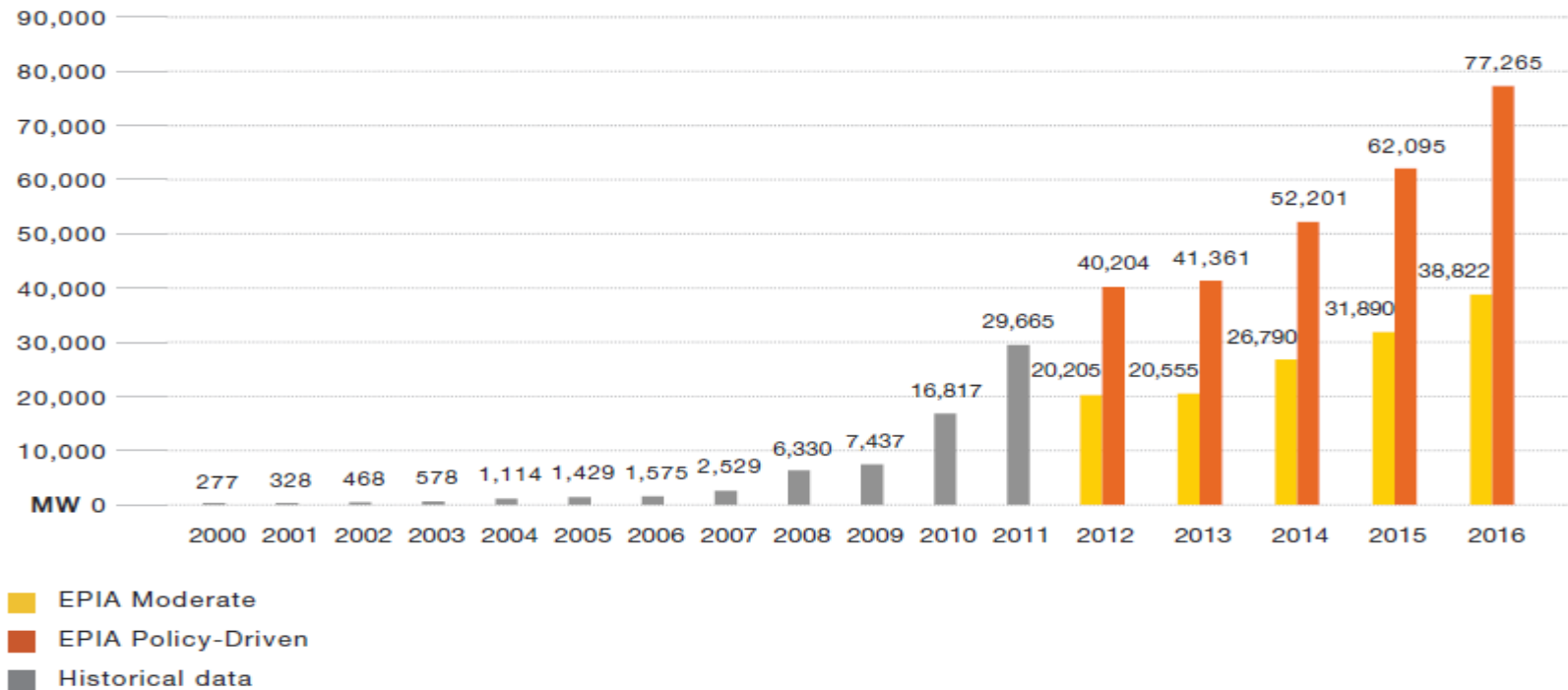
gigawatts



Source: U.S. Energy Information Administration, International Energy Outlook 2011

With Solar PV Market on the upswing, across the globe with strong Governmental support...

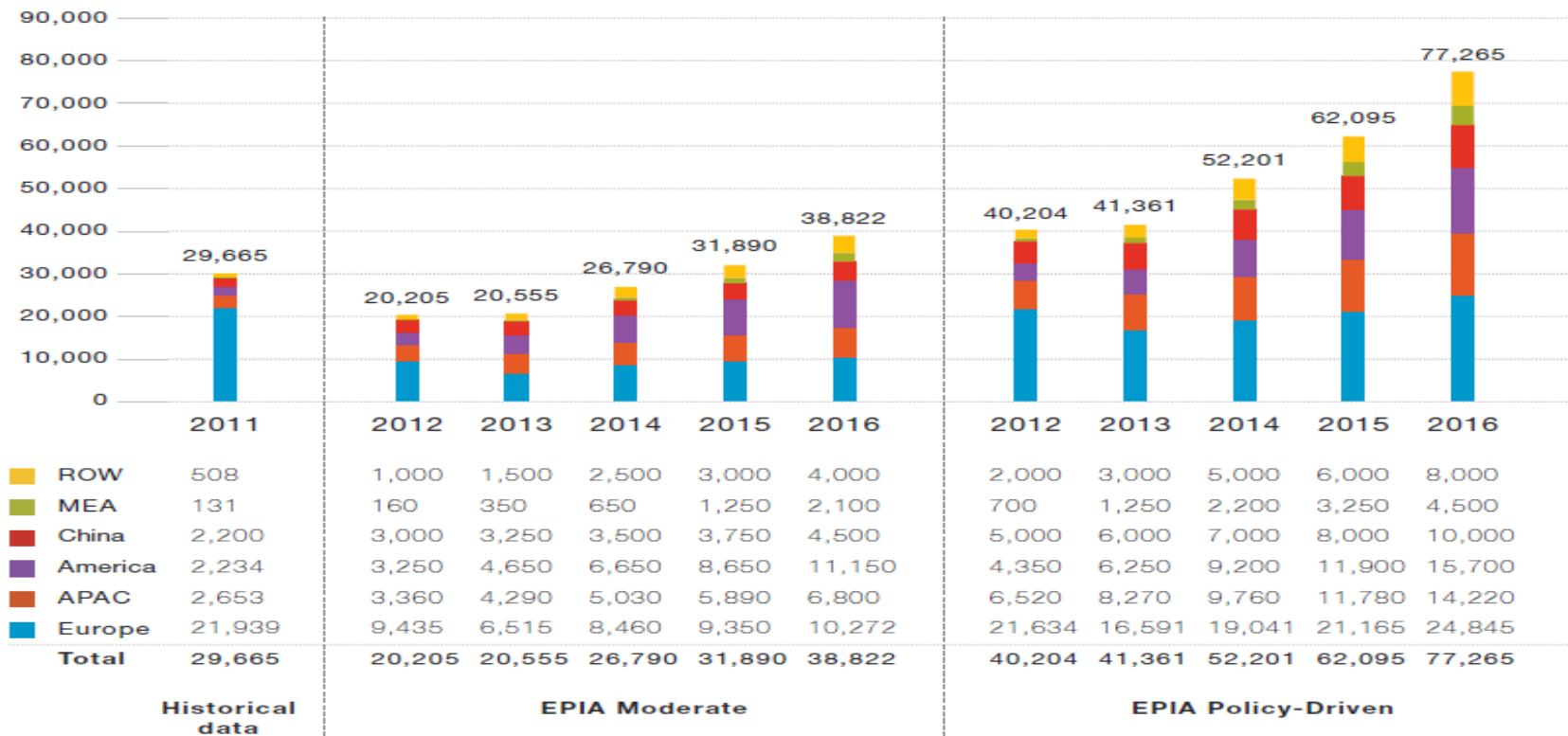
Figure 28 - Global annual market scenarios until 2016 - Moderate and Policy-Driven (MW)



Source: EPIA Global PV Market Outlook May 2012

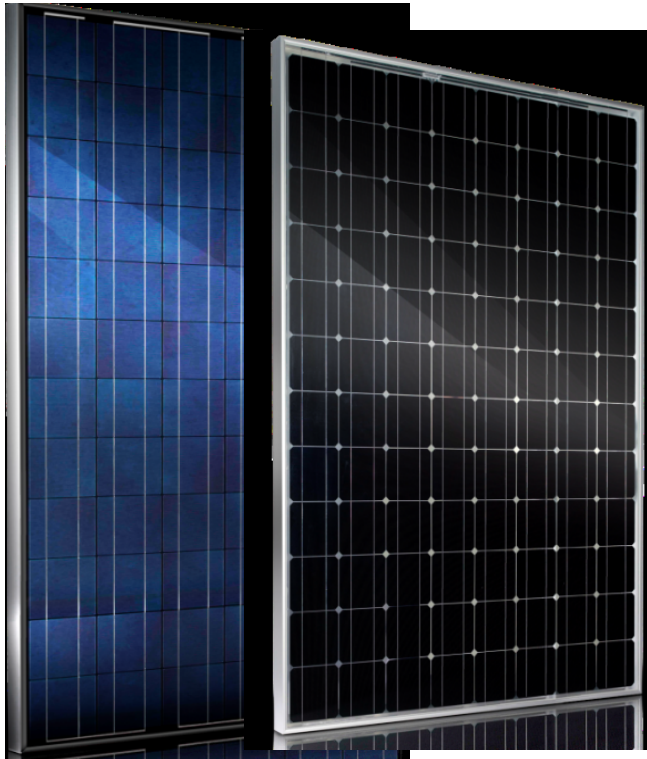
... and China, APAC, MEA the key contributors to next 4 years of Growth

Figure 29 - Evolution of global annual market scenarios per region (MW)



Source: EPIA Global PV Market Outlook May 2012

Solar PV Offering: PV Modules



Key Features of PV Modules:

- 12 years product warranty (materials and workmanship); 25 years module power output warranty
- Industry leading Plus only power tolerance: +5W (low to +2%)
- Strong framed module, passing mechanical load test of 5400Pa to withstand heavier snow load
- PV Cycle member achieves the highest economically feasible and environmentally responsible collection and recycling of PV modules

Solar PV Offering: PV Modules with stringent Quality Control

Quality Control - Implemented Initiative	Derived Results
Cell Selection – 100% Cells Inspected	<i>To guarantee no discoloured and defective cells</i>
Soldering – 100% Cell Strips inspected	<i>To guarantee no defects in soldering</i>
Lay-up – 100% Cells inspected	<i>To guarantee soldering and layup</i>
100% EL Testing before lamination	<i>To guarantee no micro crack before lamination</i>
100% Automatic lamination	<i>To guarantee lamination quality and durability</i>
100% EL Testing after lamination	<i>To guarantee no micro crack after lamination</i>
100% Flash testing of each panel	<i>To guarantee power performance of each panel</i>

Solar PV Offering: Reference Projects (1/4)



Germany Bild Soemtron DACH 3.5MW



Germany Gocelborn 4.4MW

Solar PV Offering: Reference Projects (2/4)



Germany oldenbanning 850kw



Germany feucht 138kw

Solar PV Offering: Reference Projects (3/4)



Spain Mahora 15 MW



Spain Albacete 2.5MW

Solar PV Offering: Reference Projects (4/4)



Japan BIPV 650kW



China Hongkong BIPV 135kw

Supporting Solar PV Solutions Offerings

- B&T Solutions-HUB, In addition to Supply of PV modules, also offers
 1. Project Feasibility
 2. Technical due diligence
 3. Site selection and Project Scoping
 4. Selection of Partners
 5. Project Financing
 6. Project Execution
 7. Project Management (From Concept to Commissioning)



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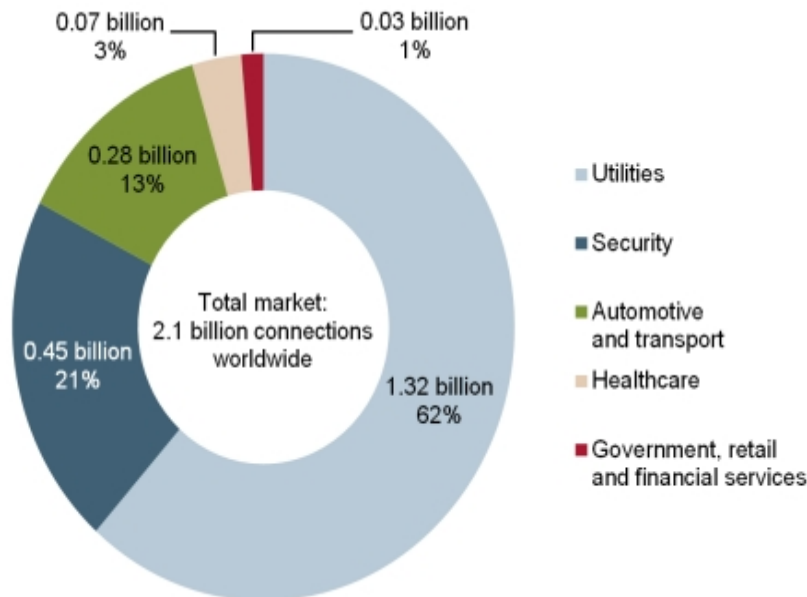
M2M Service Offerings for Utilities



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M2M Global Market: On a high growth trajectory



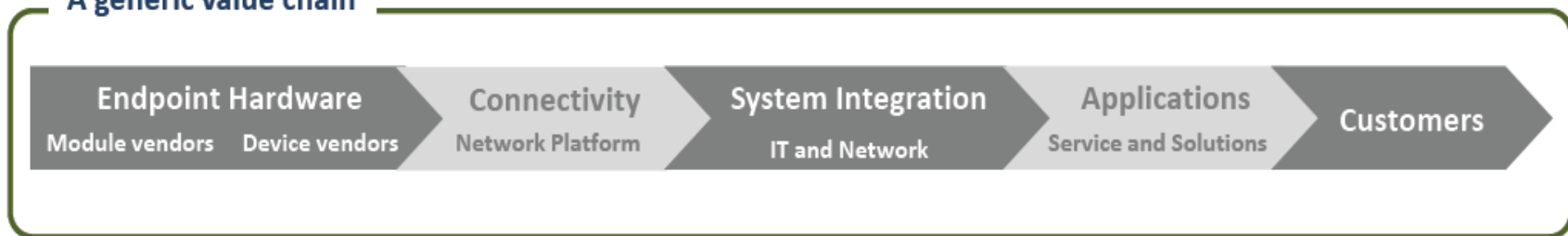
- **Volume Projections:**
 - 2011 M2M connections: 85 Million
 - 2017 M2M Connections: 600 Million
 - Y-O-Y Growth rate: 36%
- **Revenue Projections:**
 - 2011: USD 21.52 Billion
 - 2017: USD 85.96 Billion
 - CAGR: 26.1%

Adoption rate is expected to grow rapidly in automotive, Healthcare, transportation, and utilities in future owing to the rise in government regulations and need for innovative solutions.

M2M has Large Applications with various Industries



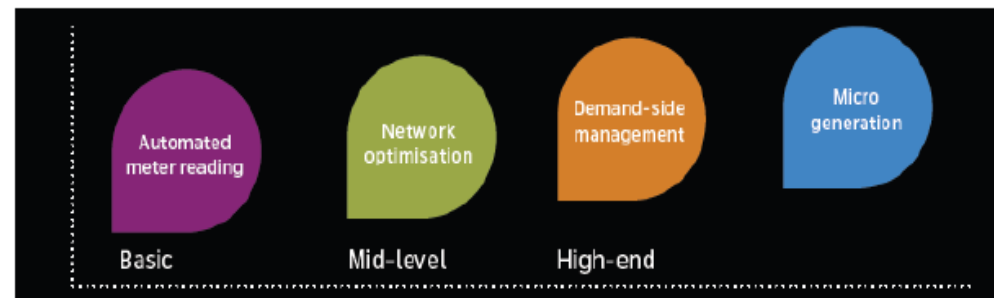
A generic value chain



With specific application for Energy Utilities



- Energy efficiency and sustainability initiatives have gained global support, driven by the strength of public policy support
 - EU has targeted smart metering to be deployed in 80% of households by 2020
 - Smart metering gaining interest in emerging markets where theft can account for 40-50 percent of the total power generated some markets
- CSPs are well positioned to support smart grid initiatives, but are challenged by efforts of utility companies to deploy dedicated communication networks



Source: Telenor (telenor|connexion) 2012

M2M Service Offering

- B&T Solutions-HUB, M2M focused Solution Offering for Energy Utilities, includes:
 1. Automated Meter reading
 2. Network Optimization
 3. Demand Side Management and
 4. Micro Generation

Contact

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COMPANY PROPOSITION

Data is a commodity; each element of data has a price. Data is converted into Information and information is mined. “Data Elements” and “Information Packages” are saved and are communicated . The Challenge is the deployment of Methods and Tools for the Management of Data, the Structuring and Interpretation of Data into usable Information, the communication and the use of the Information for improving and sustaining Life is crucial but expensive, complex, disparate, and ever changing across community boundaries.

Our solutions addresses the needs for Integration of data / information creation, data / information management, data / information recycling, data / information communication technologies, development of the Data and Information building blocks / innovative use of the available technologies and their evolution.

Expression of “Executive, Strategic and Commercial Interest in a Partnership / Collaboration” should be directed to ***Tony Wadhawan***. This interest can be for Deployment, for Technology, for Manufacturing, for Financial (Commercial) partnership or for partnership that is Specific to project/s and could be in the form of: Joint Ventures / Partnership/s / License Agreements Franchisee Agreements, not limited to one Country / Region.