



Global and U.S. Coal

Hal Quinn

President & Chief Executive Officer

National Mining Association

USEA 10th Annual State of the Energy Industry Forum

Global Coal

Energy Demand

+ 43 % through 2035

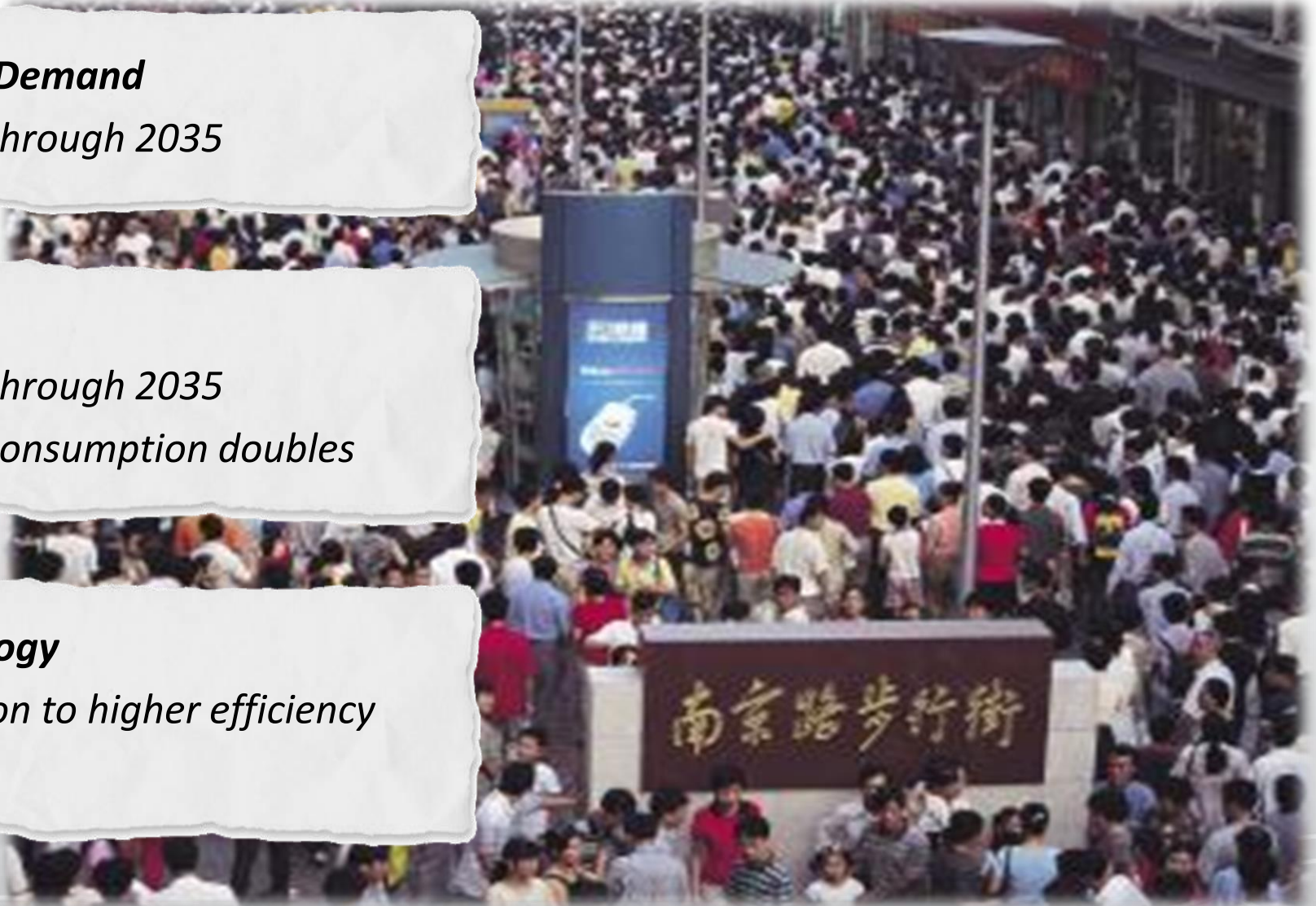
Coal

+ 44 % through 2035

India's consumption doubles

Technology

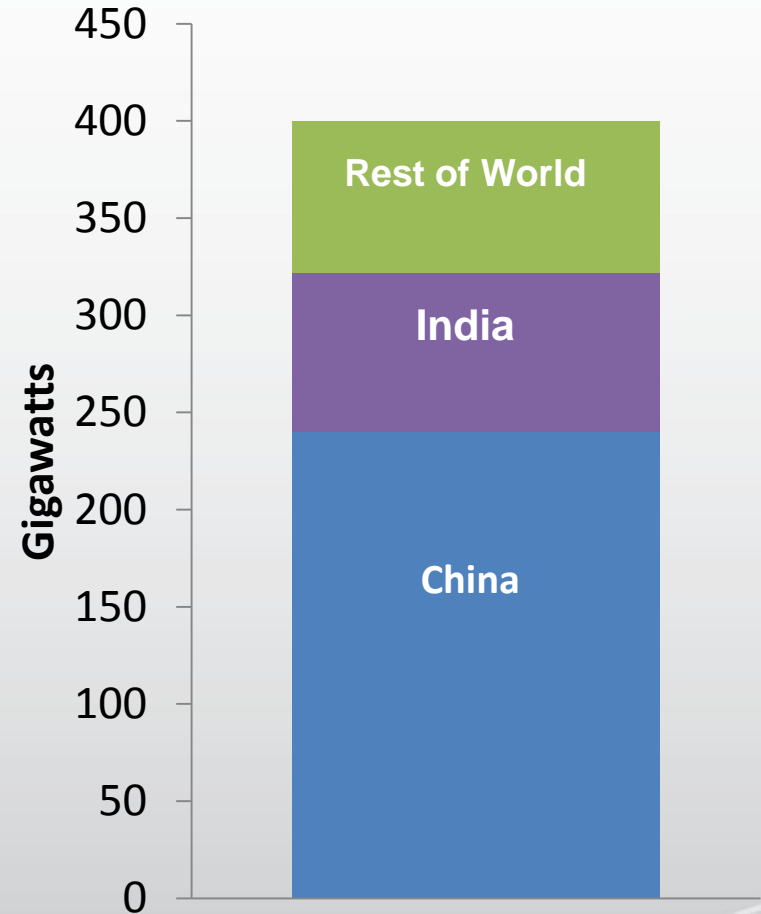
Migration to higher efficiency plants



Thermal Coal

- New coal-based generation expected to grow ~400 GW by 2017
- ~ 1 billion tons of additional coal demand
- Vast majority of growth in China and India
- + 210 million tons of seaborne demand

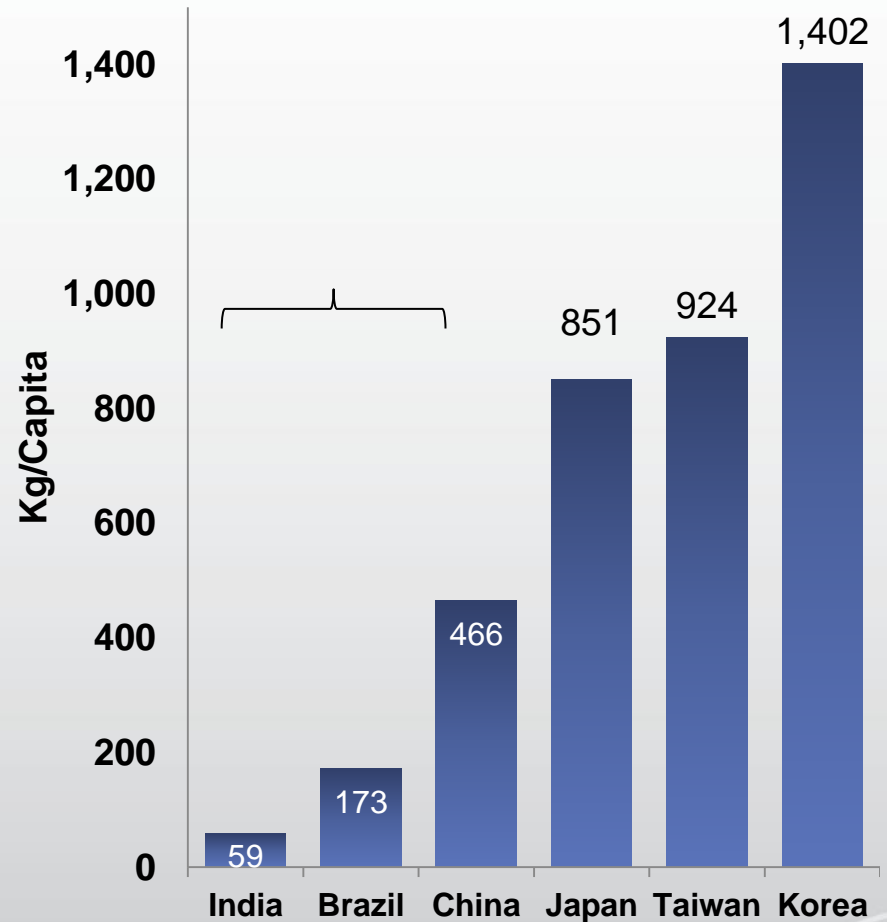
New Coal-Based Generating Capacity, 2012-2017



Metallurgical Coal

- Developing countries growing urbanization/industrialization driving demand
- Steel consumption +44% between 2007-2012
- Stable stage intensity may take 20-40 years to reach levels of developed Asia economies
- Countries will rely on imports for met coal needs: + 150 MTPY

2011 Steel Consumption Per Capita



Coal Exports

U.S. COAL Exports

LATEST NEWS Coal exports from Enhanced Coal Port Reviews (KPLU) Supporters of the coal terminals ha ... +++ March 21, 2013 - Export Opponents Ignore Economic

Coal Exports Facts & Figures

Look here for information on how America exports its coal and where it goes – safely and using the highest standards of environmental responsibility.

Supporting our economy at home while improving quality of life worldwide.

"At present 19% of the world's population, 1.3 billion people, lack access to electricity and on New Policy Scenario projections there will still be 1 billion people without such access in 2030. To meet the UN Millennium Development Goal of eradicating extreme poverty by 2015, 395 million more people need access to electricity. There is a strong correlation between electrification and improvement in the United Nations' Human Development Index."
— International Energy Agency, Coal Industry Advisory Board

Independent (Businesses Support Coal Exports (Portland Business Journal)

Coal Exports Help Developing Countries Advance (UPI)

Oregon Affirms Permit for Coal Port Expansion (The World)

COUNTY OF COAL

NMA

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U.S. Coal Exports > 2X in 5 years

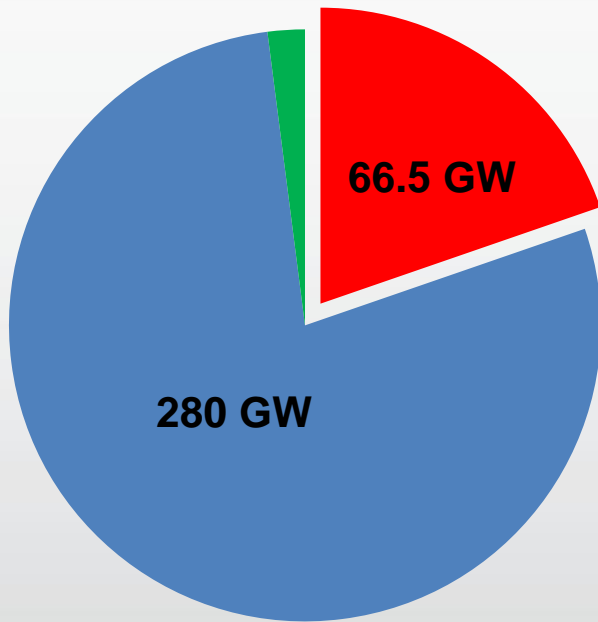
- 2007= 59.2 MST
- 2012= 125.7 MST
- Shipments to Asia and Europe double in last 3 years

Economic Lift

- Each 1 million tons of coal exported supports >1,300 jobs in coal export related industries
- Avg. wage for direct jobs in coal export industries ~\$96,100

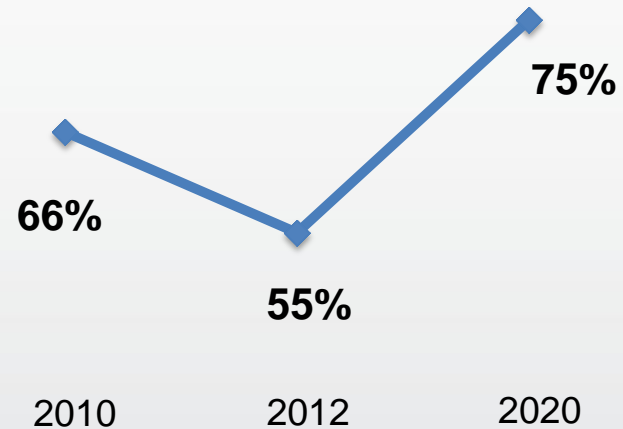
US Coal Rebounds

U.S. Coal Fleet
(In gigawatts of capacity)



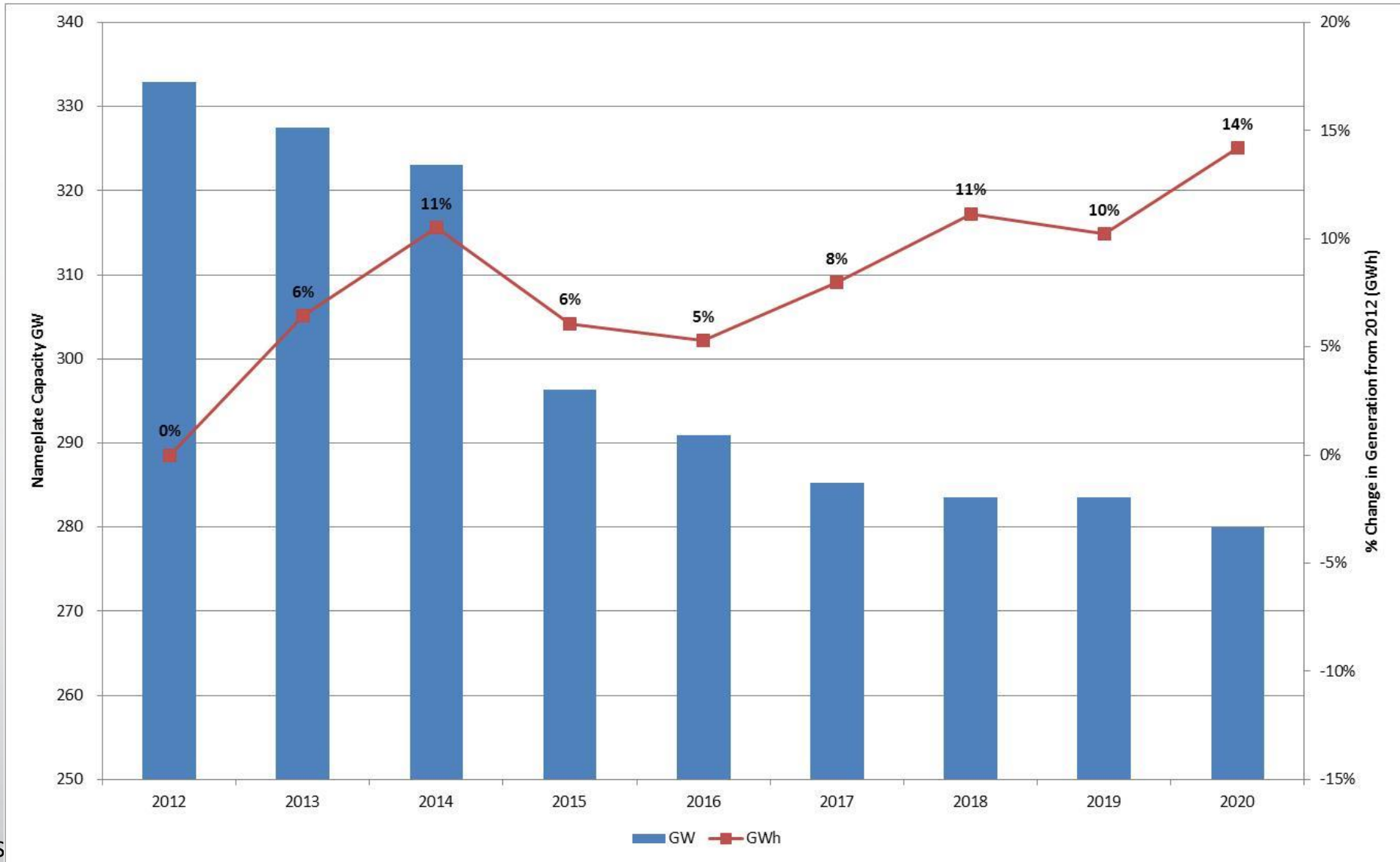
- Capacity at risk of retiring by 2020
- Expected capacity to remain online
- Includes 7 GW New Capacity

U.S. Coal Plant Utilization
(Remaining 280 gigawatts)



2020: ~110 MST recovery from 2012 levels

Name Plate Capacity Drops --- Generation Rises



CCS: Adequately Demonstrated?



- ***Carbon capture at coal plants is not demonstrated at scale and not commercially available — Alstom***
- ***Kemper Project cannot be consistently replicated — Southern Co.***
- ***Kemper Project is “not a good model” for future plants because of unique characteristics — Gina McCarthy***
- ***Literature reviews, pilot projects and facilities yet to operate does not support finding that CCS is adequately demonstrated – Interagency Comments to EPA***



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