

Advanced Strategy for the Energy Future

ACEEE Market Symposium on Market Transformation

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- Planning for the energy future
- Robust strategies for the future
- Actions for corporate energy management

The energy future is uncertain



- Energy supply markets are less certain
- Competition among energy users
- Climate change and greenhouse gas (GHG) emissions
- Growing scrutiny

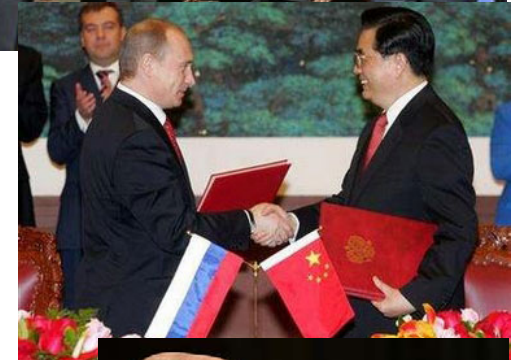
Unpredictability of energy markets increasing



Energy costs continue to rise

- Electricity market volatility
 - Natural gas prices impact many electrical markets
 - Marginal and locality pricing in some markets
 - Reliability of grid and service at peak demand periods
 - Average electricity prices for all end uses are projected to increase between 6.4%-10.8%
- Oil & gas market volatility
 - Supply & distribution constraints
 - Questions about pricing policies
 - Nationalization of oil assets
 - Natural gas prices historically affected by crude prices
 - Natural gas surcharges – up 75% since 2005
- Coal less volatile but varies regionally

Makes forecasting more difficult



Market volatility increases risk and uncertainty

World demand for energy increasing



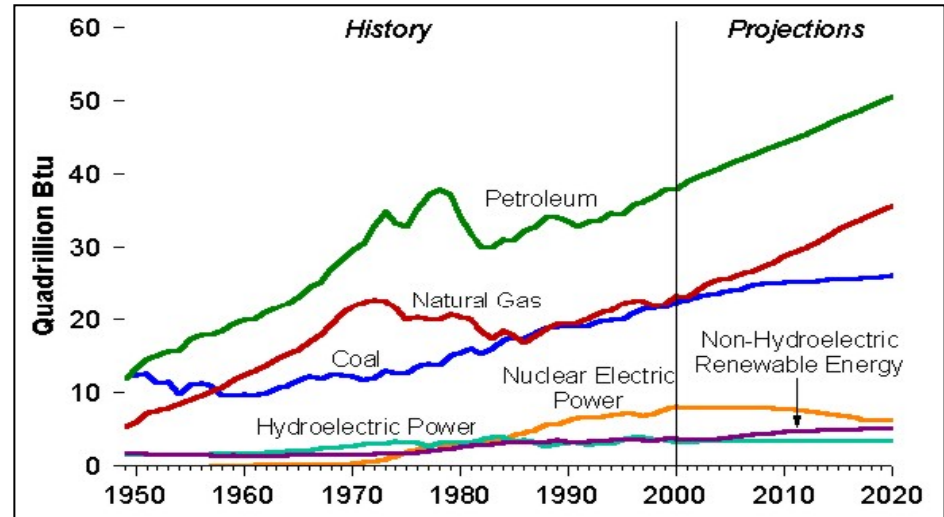
US energy demand is forecast to grow 40% by 2025

- Demand increase is equivalent to building 50-60 new power plants per year

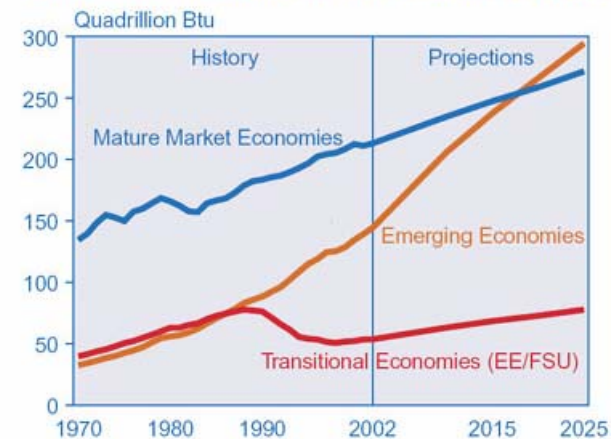
International demand for energy is growing rapidly

- Demand for electricity is expected to nearly double between 2002 and 2025, from 14,275 billion kWh to 26,018 billion kWh

Growing demand adds to risk and uncertainty



World Marketed Energy Use by Region, 1970-2025



Sources: **History:** Energy Information Administration (EIA), *International Energy Annual 2002*, DOE/EIA-0219(2002)



Intergovernmental Panel on Climate Change:

- Greenhouse gases (GHGs) and temperatures are rising; warming of climate system is considered “unequivocal”
- Human activities have induced most of the warming over the past 50 years (over 90% certainty)
- Better modeling has enhanced confidence in statements of impact and future climate projections
- A range of stabilization levels can be achieved by deploying a portfolio of current and future technologies

Time to change the view of energy



- Energy is no longer just a support to doing business
- Energy presents new impacts, risks and opportunities
- Organizations need to **plan for the “energy future”**

- **Questions to consider**
 - **How might the energy future look?**
 - **How will it influence energy management?**

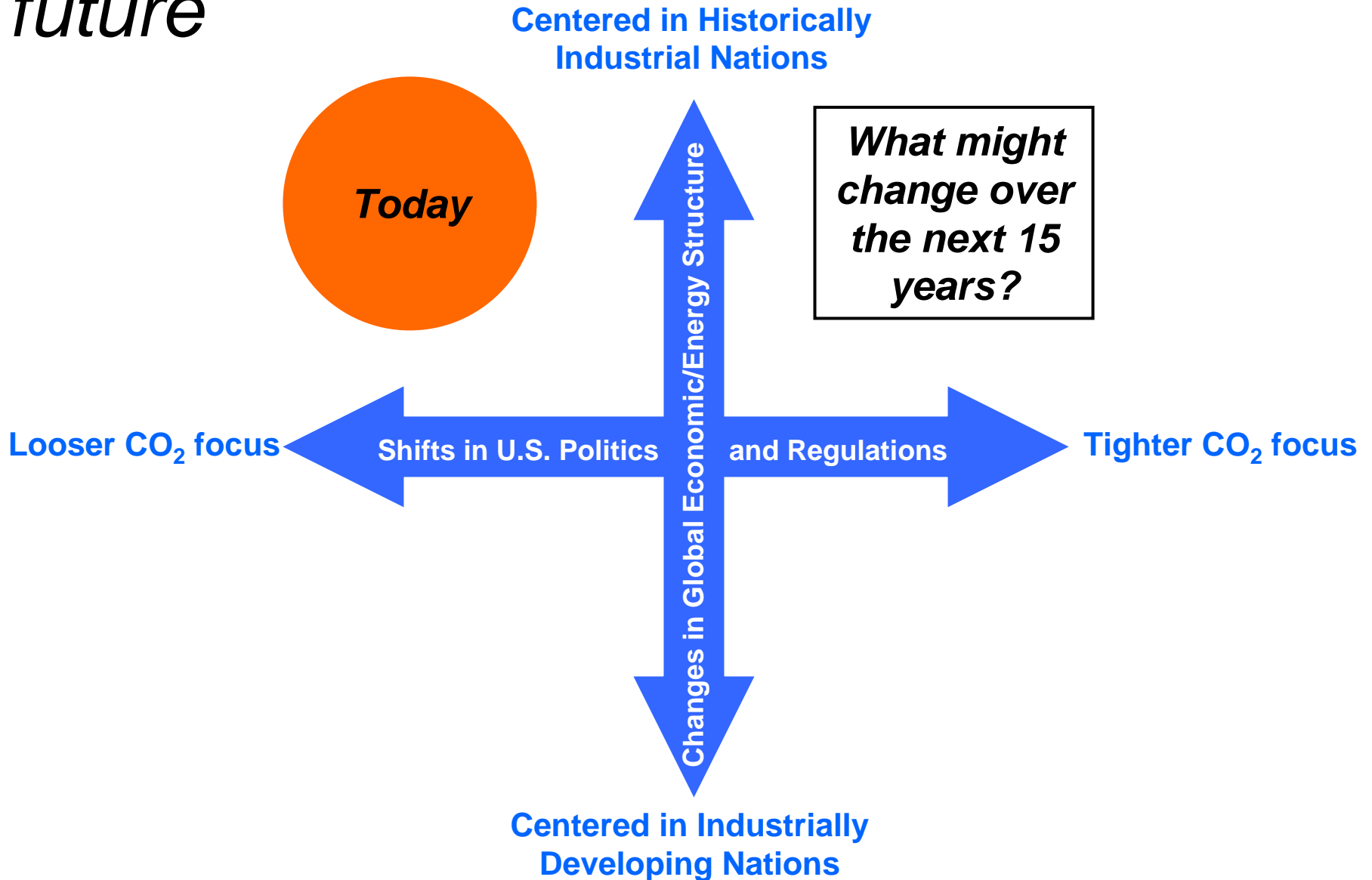
Critical framing uncertainties



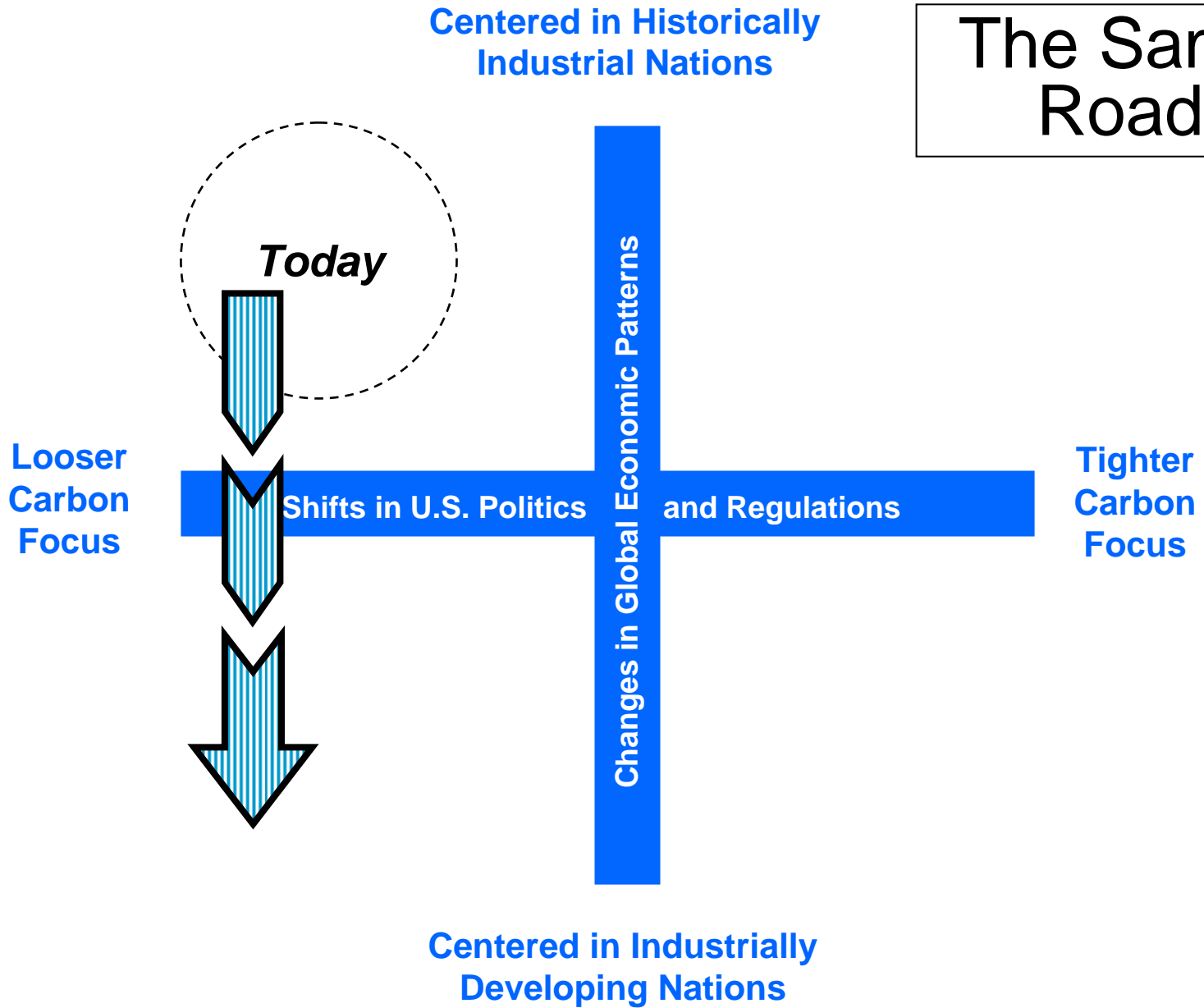
How might shifts occur in U.S. political and regulatory arrangements, especially as it relates to carbon dioxide emissions and climate change?

How might changes occur in global economic patterns, markets and rules that drive general energy demand, supply, and prices?

Framework for thinking about the future



The Same Road



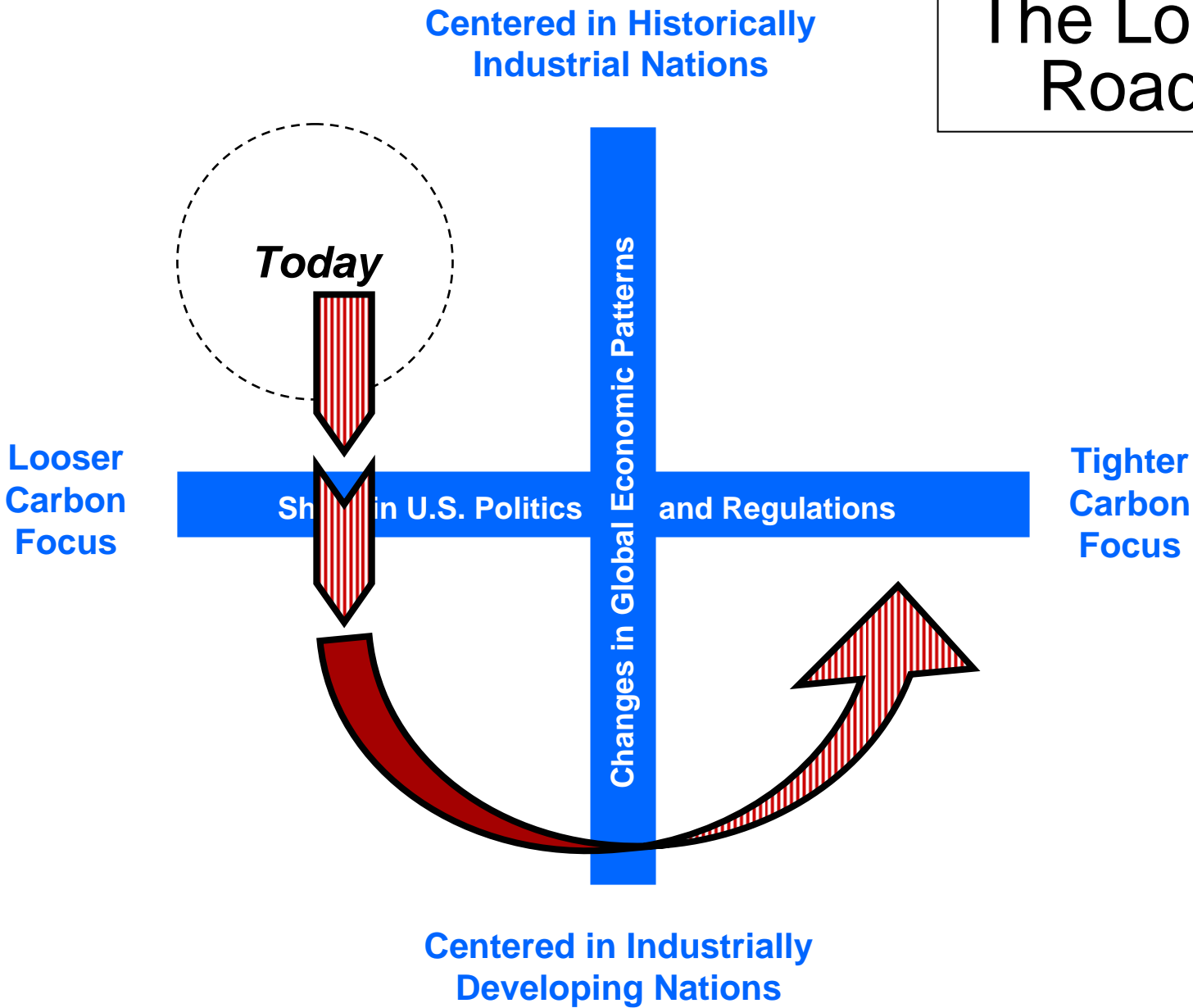
Key developments for The Same Road



- This is a world in which a combination of political inertia and global economic growth keeps the U.S. energy environment in familiar territory.
- Energy prices fluctuate in well established patterns, along an upward trend with a series of price spikes.
- Economic power steadily shifts toward developing nations, but not at a disruptive pace that threatens the historically industrialized nations.
- There is slow growth toward strategic energy management due to relatively low energy prices, few government incentives, and lack of policy initiatives to address climate change.

By 2015, China surpasses the U.S. in energy use and also in several key industrial markets. India and Southeast Asia now equal the European Union in overall GDP. The U.S. becomes just one key player among several, as China and India wield greater influence in both the United Nations and the World Trade Organization, and the EU continues a steady expansion and integration.

The Long Road



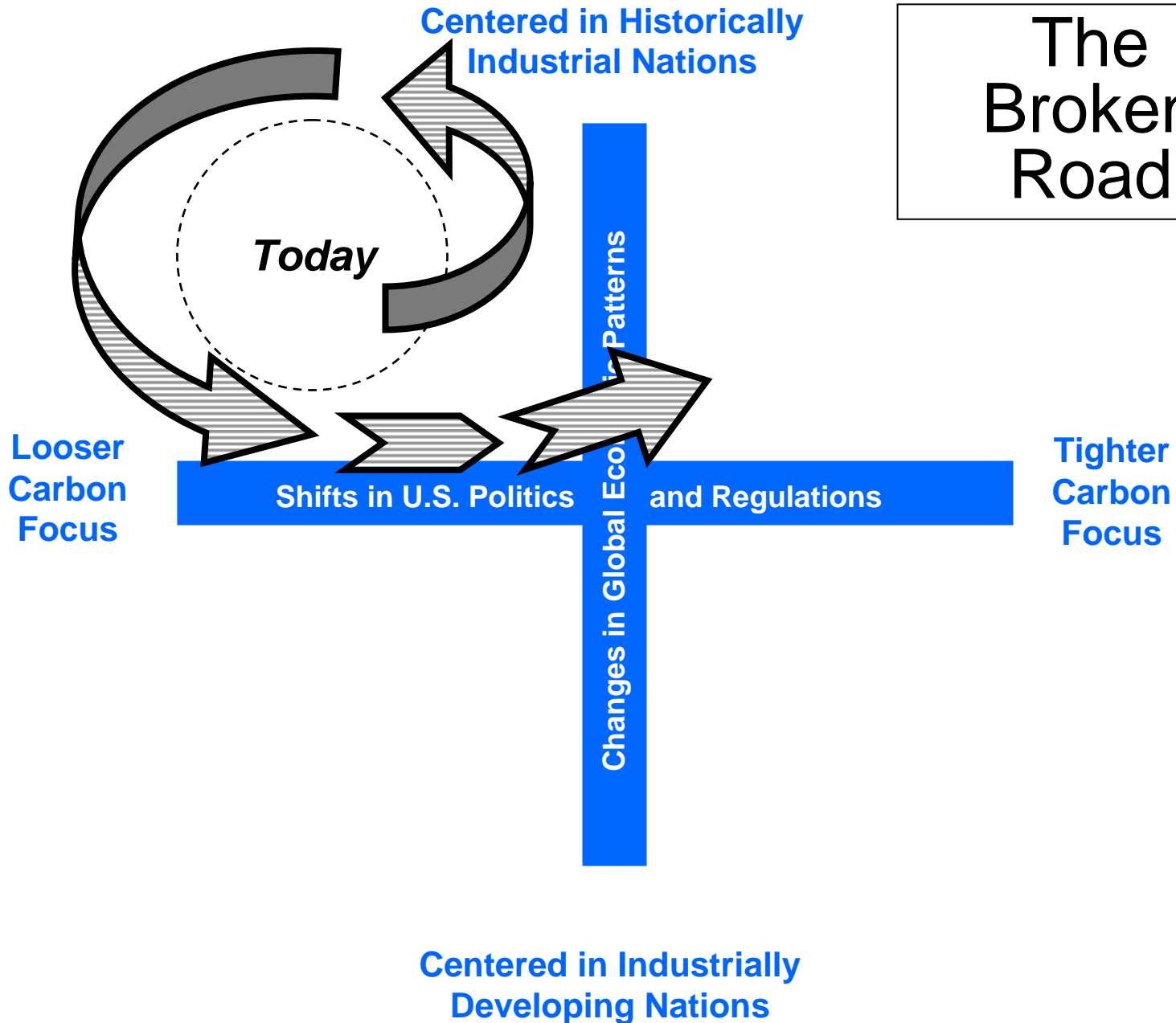
Key developments for The Long Road



- This is a world in which a combination of rapidly shifting political conditions, along with booms and busts in global economic growth, push the U.S through a long, hard transition similar to the 1970s.
- Energy prices fluctuate, with large and sudden spikes, and traditional energy supplies are subject to disruption and insufficient investment.
- Economic power shifts significantly toward developing nations in a way that is very disruptive to the historically industrial nations and ultimately unsustainable for the newly emergent.
- Movement toward strategic energy management is overly cautious and almost too late, only happening after energy prices rise, the locus of economic power shifts, consensus around climate change passes a tipping point, and companies have had to face long and difficult adaptive challenges.

In 2012, the long-feared Chinese banking crisis hits. The weaknesses of central planning, uncertain legal structures, and corruption hit China hard, sending repercussions throughout the global economy. Stagflation emerges when prices driven by inflexible costs meet declines in demand, bringing a global recession in early 2013. Meanwhile, destructive droughts and storms are increasing in more places around the world.

The Broken Road

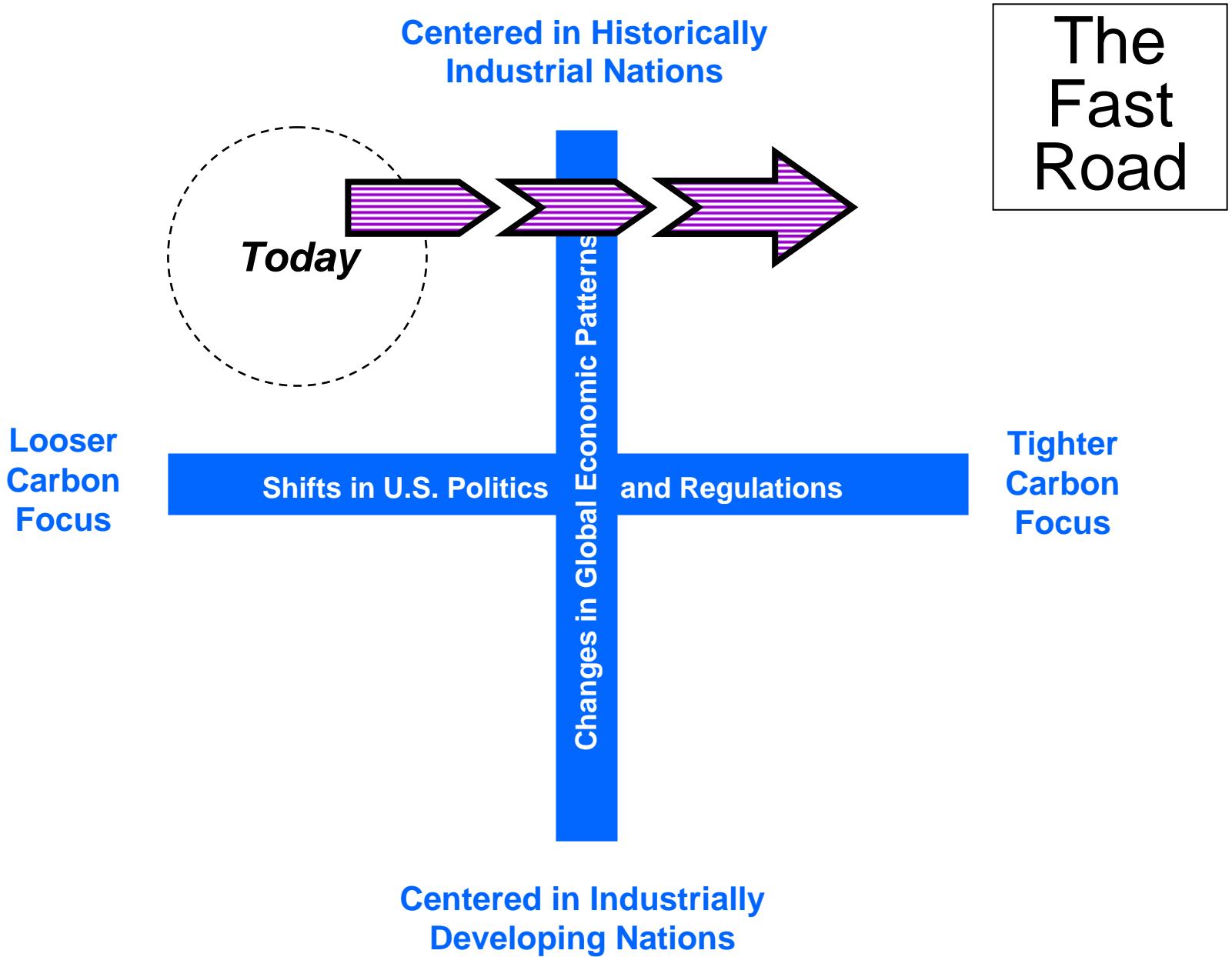


Key developments for The Broken Road



- This is a world in which a combination of political indecision & uneven global economics set the stage for a sudden break with the past.
- Energy prices fluctuate in well-established patterns for several years, until severe weather & geopolitical tensions create a supply shock that kicks up prices & long-term concerns.
- Through the resulting gyrations in global trade, currency, and energy markets, American political and business will crystallizes quickly to jump-start & accelerate national programs to move the U.S. to global leadership.
- Though late, this movement toward strategic energy management finally takes place at a torrid—& successful—pace.

In 2017, the federal government declares a National State of Energy and Climate Emergency. The President launches an aptly named “Manhattan Project II” to aggressively develop new fuels, urban design approaches, and carbon reduction technologies. Carbon emission monitoring and enforcement are backed up with stiff fines that rapidly shut down some old operations. Climate penalties even threaten jail time for executives, with the public asking, “How could they have ignored this issue for so long?”



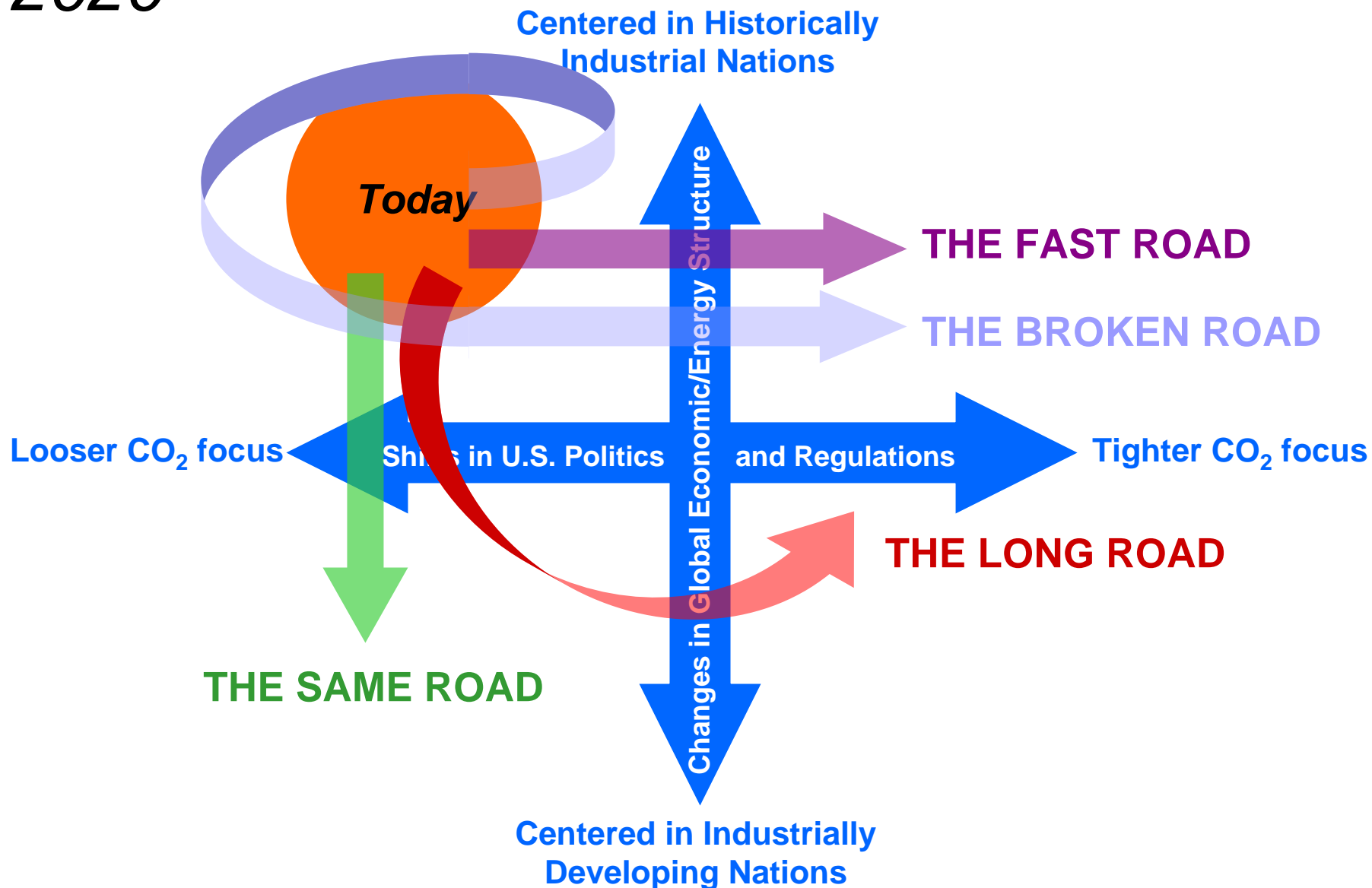
Key developments for The Fast Road



- This is a world in which, as a result of a combination of early political leadership & effective global economic and environmental decisions, the U.S. energy environment moves into a new territory of innovation.
- Energy prices rise steadily & are high enough to allow investments in alternative energy, efficiency, & urban redesign to pay off.
- A political consensus emerges early in the U.S. for tight but incentive-heavy regulations to control carbon dioxide emissions.
- A moderate shift in economic power toward developing nations does not threaten or disrupt the already industrialized nations, & the U.S. in particular benefits from the global expansion into the industrially developing world as it sells more high technology products & services.

After 2016, the U.S. accomplishes an amazing feat of transition to a less energy-intensive industrial base. There is still a lot to do. Old buildings and urban land-use policies still need to be overhauled, and the automotive fleet requires a complete turnover. But there is no debate that the changes underway will succeed. Greenhouse gas monitoring and control is now widespread throughout the economy; people are as accustomed to it as they are to recycling.

Scenarios for the U.S. Energy Environment, 2020



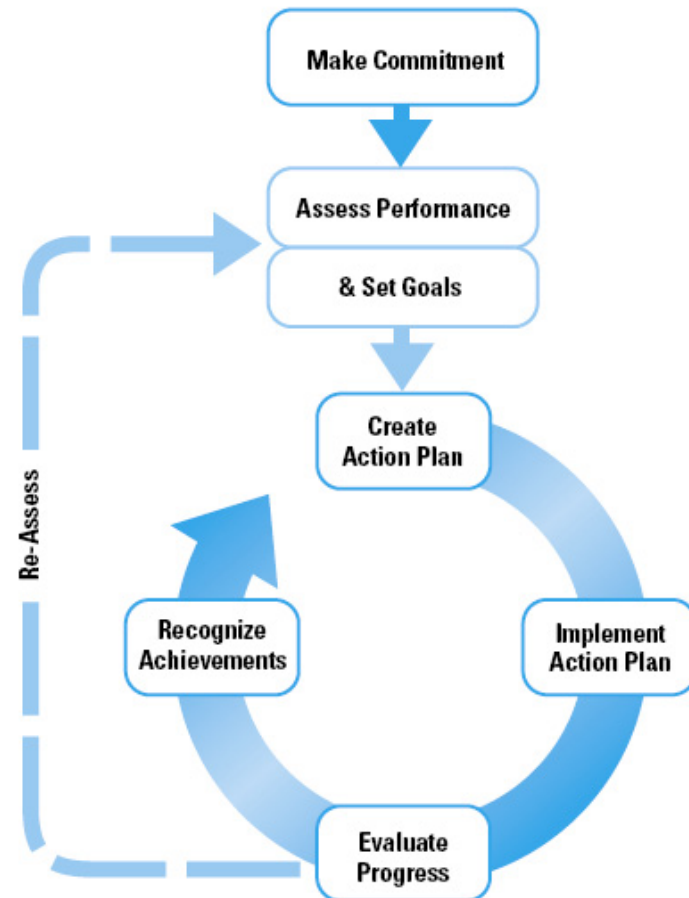
Strategy 1: Master fundamentals of corporate energy management



ENERGY MANAGEMENT FUNDAMENTALS

- **Executive commitment** to continually improve energy efficiency across the entire corporation, including clear processes and tracking systems to **identify opportunities**
- An **empowered corporate energy director and energy team** supported by sufficient human and financial resources
- A **corporate energy policy** that is accounted for at the top levels of the corporation
- Aggressive, numeric **energy goals** that stretch performance targets to draw out creative innovations for meeting them
- **Measurement and tracking of energy performance** for all energy use, corporation-wide, including **benchmarking facility performance** nationally and globally with similar companies, and a **review system** with accountability at all levels
- Communication on the value of energy, importance of improvement and executive commitment by consistently **recognizing accomplishments**

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Strategy 2: Search out transformation opportunities

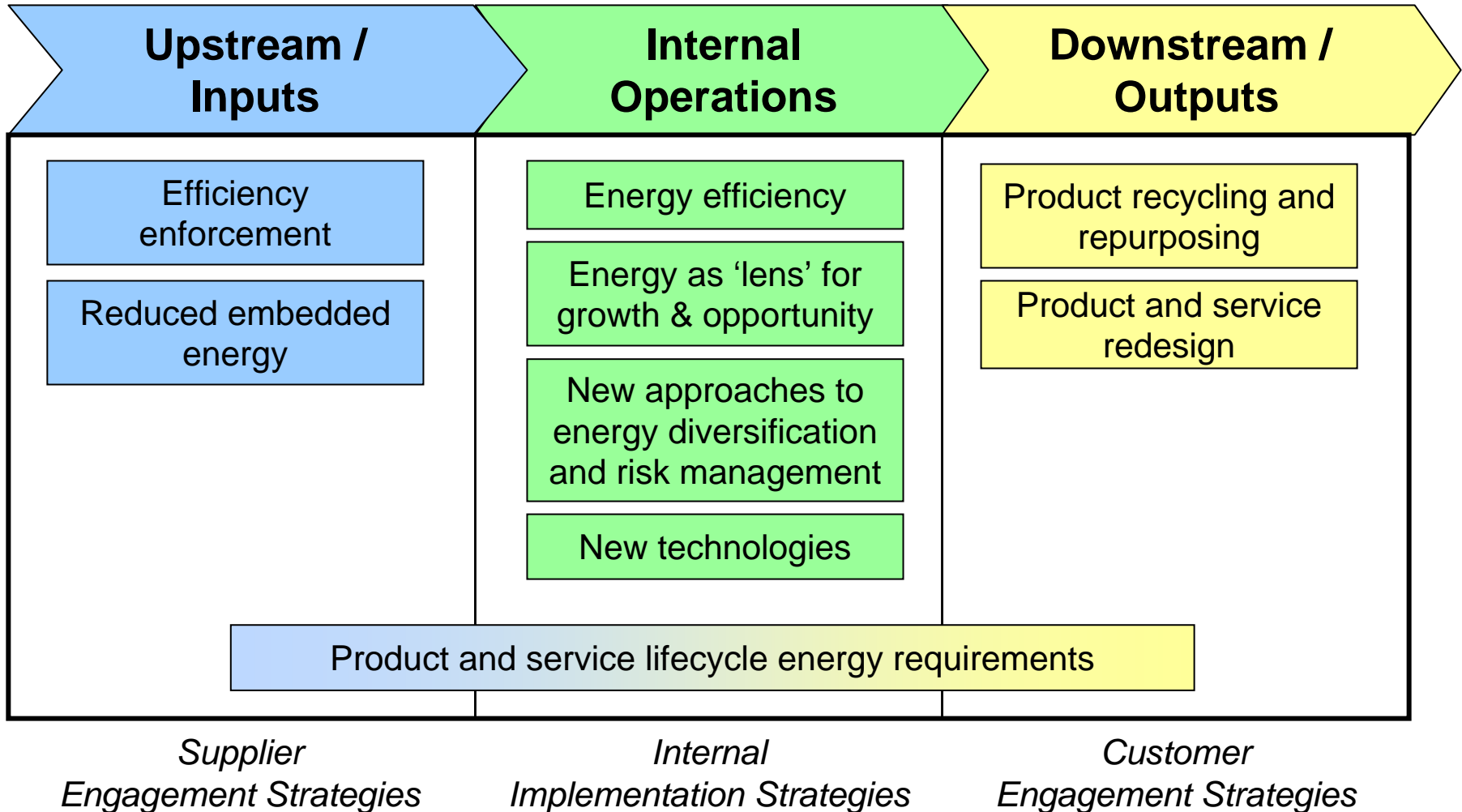


- **Energy productivity** – value energy in terms of corporate productivity
 - places energy on equal footing with labor, material, capital, & other operating expenses
- **View energy investments over longer term, reducing high hurdle rates**
 - generally lower risk
 - provide sustained and predictable return on investment
- **Innovation is key in realizing the transformation**

Strategy 3: Take a broader view



Energy Value Chain



Senior executives are key



- Set the priorities and direction for a company
- Should be involved in defining need for and scope of a corporate energy strategy
- Empower staff and enable energy investments
- Involve themselves

Energy Strategy for the Road Ahead



- Advanced energy strategies and considerations for guiding corporations into the future
- Developed by senior executives, Global Business Network and EPA ENERGY STAR
- www.energystar.gov/energystategy

