



The INGAA Foundation, Inc.

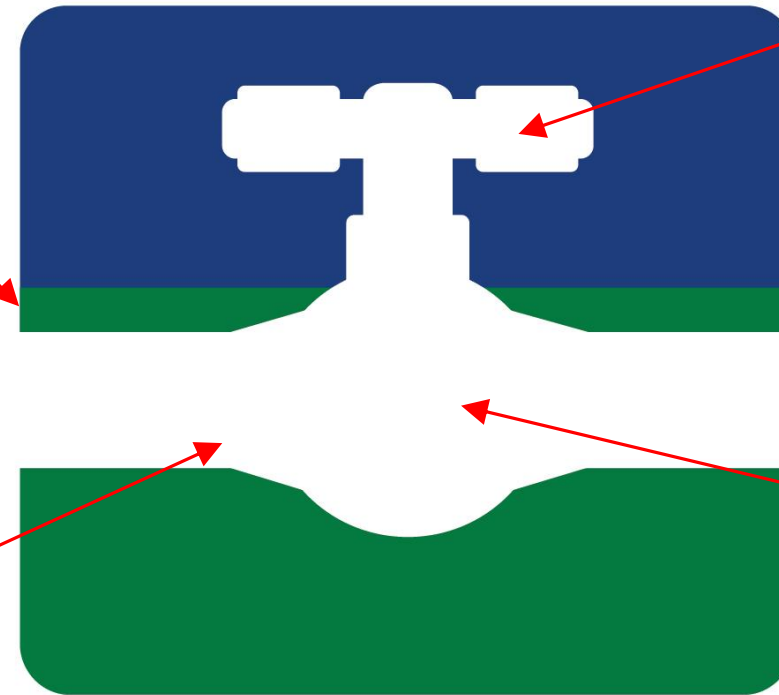


Moved Blue/Green split to represent buried pipe

Actuator instead of handwheel

Welded ends – no flanges

Ball Valve instead of gate valve



**The INGAA
Foundation, Inc.**
30 YEARS OF EXCELLENCE





INGAA



FOUNDATION

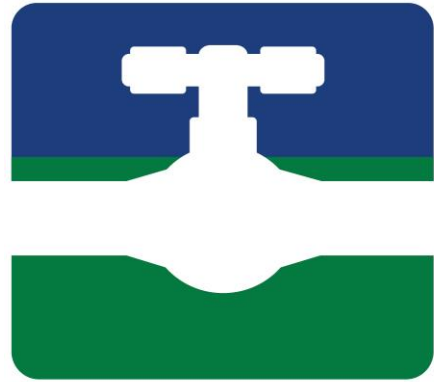
30 YEARS OF EXCELLENCE



**The INGAA
Foundation, Inc.**

30 YEARS OF EXCELLENCE





INGAA

FOUNDATION

30 YEARS OF EXCELLENCE

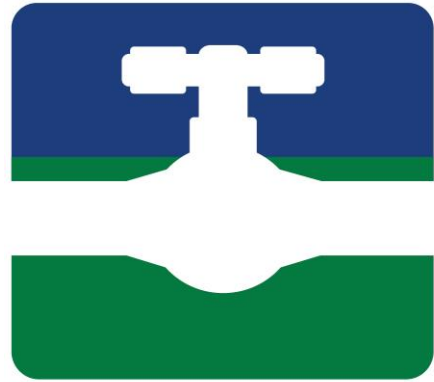
2019 ANNUAL MEETING

Monarch Beach Resort

Dana Point, California

November 1, 2019





INGAA

FOUNDATION

30 YEARS OF EXCELLENCE

WELCOME

Victor Gaglio

Senior Vice President & COO, Duke Energy Natural Gas Business Unit

Chairman, The INGAA Foundation



ANTITRUST COMPLIANCE GUIDELINES

In all Foundation activities, you must avoid any discussion or conduct that might violate the antitrust laws or even raise an appearance of impropriety.

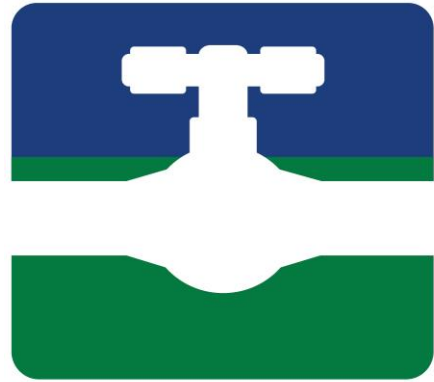
- **Commitment**

The INGAA Foundation and its member companies are committed to full compliance with all laws and regulations, and to maintaining the highest ethical standards in the way we conduct our operations and activities. **Our commitment includes strict compliance with federal and state antitrust laws, which are designed to protect this country's free competitive economy.**

- **Responsibility for Compliance**

Compliance with the antitrust laws is a serious business. Antitrust violations may result in heavy fines for corporations, and in fines and even imprisonment for individuals. **You bear the ultimate responsibility for assuring that your actions and the actions of any of those under your direction comply with the antitrust laws.**





INGAA

FOUNDATION

30 YEARS OF EXCELLENCE

SAFETY MOMENT

Kevin Parker

Vice President, Health, Safety & Environment

Mears





mears

A QUANTA SERVICES COMPANY

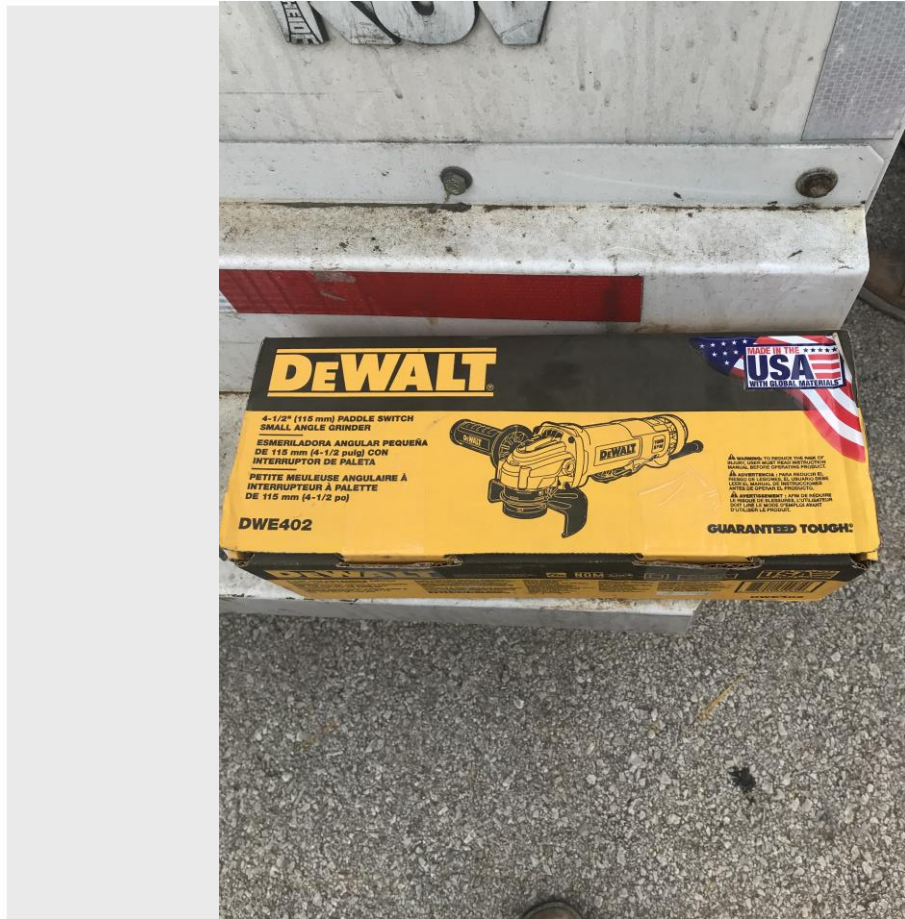
Hand Held Grinder Safety

Kevin Parker, VP HSE

Non-Typical Project



DeWalt Grinder



Shattered Grinding Cup





Grinding Cup and Grinder





Grinder and accessories





Preliminary Investigation/Lessons Learned

- Task was not standard task for crew/employees
- Task and associated hazards not identified on JHA
- Different statements on where grinder cup came from
- Grinder and cup may have been improperly stored in tool truck
- Grinder cup not appropriate size or RPM for grinder size



Preliminary Investigation/Lessons Learned

- No handle, no guard in place
- Grinder cup not inspected
- Improper PPE – No gloves, face shield



Preliminary Investigation/Lessons Learned

- Immediate leadership call across all locations to discuss incident and preliminary findings.
- Direction from Senior Leadership to visit all crews to inspect grinders, accessories, and proper PPE. Discuss incident.
- Checklist developed to share with all crews on proper grinder use.
- Incident information shared with leadership across all divisions/companies.
- Lessons learned developed and shared.
- Re-evaluation of existing training pertaining to grinders



Thank you





INGAA



FOUNDATION

30 YEARS OF EXCELLENCE

**PIPELINE SAFETY MANAGEMENT SYSTEMS
& THE ROLE OF SERVICE PROVIDERS**

Mark Hereth

Managing Partner

Blacksmith Group / P-PIC



Pipeline Safety Management Systems: The Role of Service Providers

INGAA Foundation Annual Meeting – November 1, 2019

Mark Hereth
The Blacksmith Group

What do we do on every job?

Job Brief

Overview of work to be conducted

Review hazards, abnormal operating conditions

Review procedures

Do we have the right materials, equipment and tools?

Questions, discussion

Commence work

After breaks . . . Has anything changed . . . Modify as required

Tie to PSMS

Employee/ Contractor Engagement
Application of Risk Management

- *seek verbal confirmation*
- *including depressurization and re-pressurization*

Use of Operational Controls

- *walk down the job site reviewing job package and drawings and work nearby*

Use of Operational Controls

Employee/ Contractor Engagement

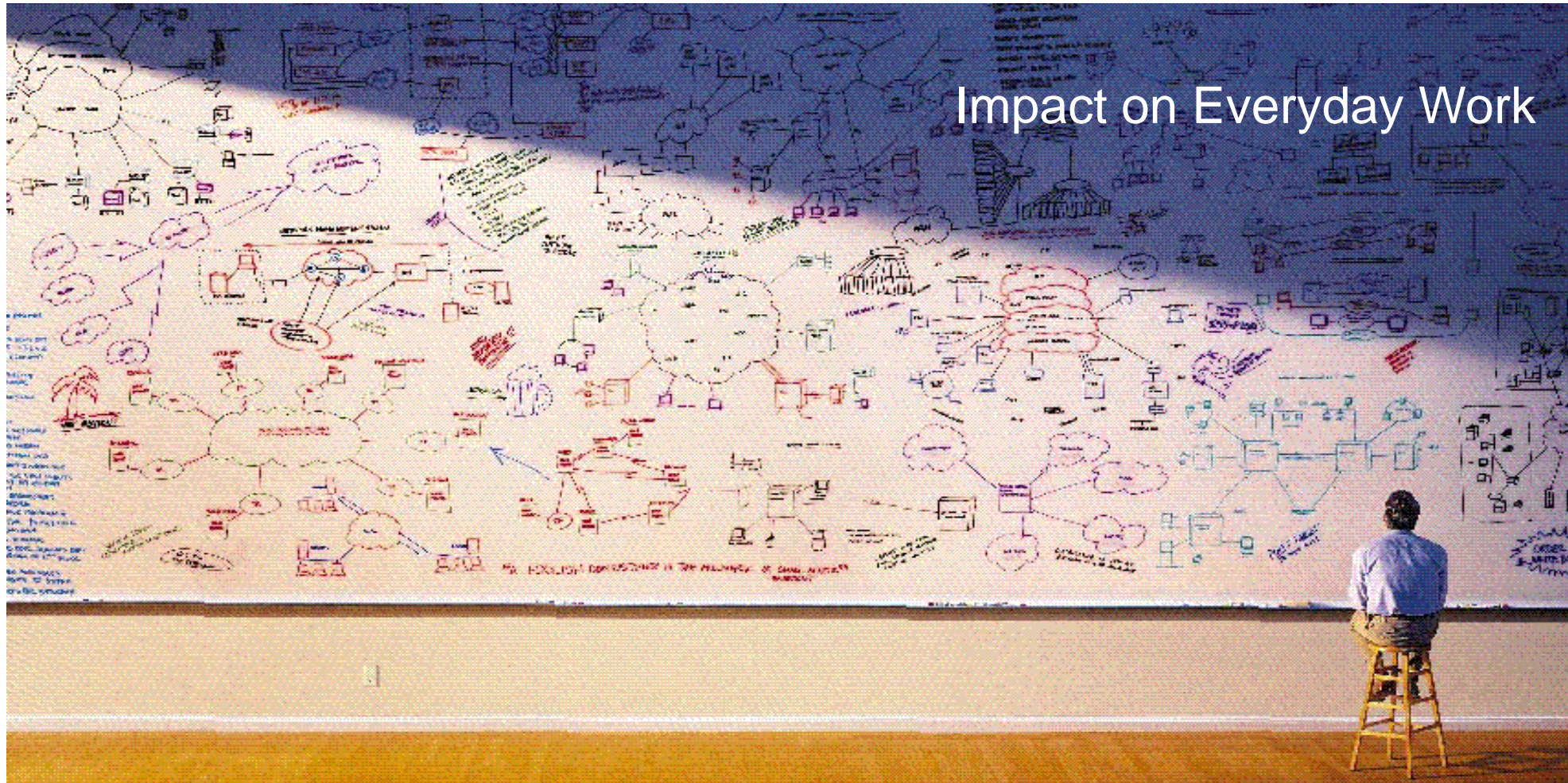
Use of Operational controls

Use of Management of Change, if significant change has occurred

Construction Safety Consensus Guidelines		Job Safety Analysis	
The IAGAA Foundation, Inc.	Document: CS-G-2	Revision: 0	Publication Date: 0-18-17
1.0 ACTIVITY DESCRIPTION			
1.1 The purpose of a Job Safety Analysis (JSA) program is to mitigate or eliminate hazards associated with performing specific job tasks. The JSA program safety manager oversees exposure to job-site hazards by providing a process and tool to identify, evaluate, discuss, mitigate, and document potential hazards and appropriate control measures. JSAs are vital to an organization's overall safety program because they encourage operational prioritization of safety, integrate safety as part of the work task for high risk and/or novel activities, and encourage safety communication at the crew level.			
1.2 The purpose of this document is to describe guidelines for the preparation and communication of task-specific JSAs. Although a JSA (sometimes called a Field Level Hazard Analysis [FLHA]), a Job Hazard Analysis (JHA), Site Specific Safety Plans (SSSP), and Toolbox Talks are all jobsite safety-related tools, each plays a different role. For these guidelines, the following definitions will be used:			
1.2.1 Job Safety Analysis (JSA) – JSAs are prepared for a specific work activity that will be performed. JSAs are performed to identify hazards (real and potential) that are, or may be, present at the specific work location under current environmental conditions (weather, external impacts, etc.) and to prescribe the appropriate mitigation of the identified potential hazard(s), before commencing a work activity. JSAs should be updated when activities or conditions (weather, soil conditions, etc.) change during performance of the task.			
1.2.2 Field Level Hazard Analysis (FLHA) – FLHAs are basically the same as JSAs.			
1.2.3 Job Hazard Analysis (JHA) – A JHA is a document that identifies the general hazards of and mitigation measures for common construction activities or tasks, such as excavation, stringing pipe, lowering-in, welding, tie-ins, bending, etc.			
1.2.4 Site Specific Safety Plan (SSSP) – An SSSP is a document that is developed for each specific project, identifying its safety hazards and how to mitigate them. A SSSP can be important source material for creating JSAs.			
1.2.5 Toolbox Talks – Toolbox talks are utilized for a wide variety of topics (e.g., safety, task review, environmental, land owner considerations, etc.). Toolbox talks are particularly useful when discussing safety to review "good catches" or incidents that have happened within a company or they can be lessons learned that have been shared in our industry (e.g., refer to the IAGAA Foundation Lessons Learned Database).			
1.3 The basic JSA described in this document is most often prepared by the Crew Leader or Foreman (or other personnel as assigned or designated by the Foreman), with ACTIVE input and participation from the crew members, and used to stimulate substantive conversation regarding task steps or sequencing, specific hazards, and the corresponding control measures.			

Objective:

Clearly See How Your Work is a Critical Part of an PSMS



Example: Field Applied Coating

- Foremen - ensure adherence to procedures
 - Quality Control
 - Key control parameters
 - *Operational Controls*
- Inspectors - evaluate quality
 - Quality Assurance
 - *Safety Assurance*
- Oversight – audit of quality
 - Audit
 - *Safety Assurance*



Field Applied Coatings Best Practices

Table of Contents

Team Members.....	ii
Section 1. General/Rationale.....	1
Section 2. Terms and Definitions.....	1
Section 3. Coating Material Handling & Storage.....	3
Section 4. Training and Qualification.....	3
Section 6. Field Application.....	5
Section 7. Inspection Procedures.....	8
Section 8. Remediation and Re-Inspection.....	9
Appendix A. Referenced Standards.....	10
ISO—International Organization for Standardization.....	10
NACE—National Association of Corrosion Engineers.....	11
SSPC—The Society for Protective Coatings.....	11
ASTM—American Society for Testing and Materials.....	12
Appendix B. Sample Forms for Reporting, Data Management & Certification Procedure Qualification and Quality Control Report.....	13
Applicator Qualification Report.....	15
Coating Application and Inspection Report.....	17
Coating Repair Report.....	19
Appendix C. Coating Training Guidance from Team 5, Training Guidance (KISS) for Construction Workers and Inspectors – Welding & Coating.....	21

The INCAA Foundation | Field Applied Coatings Best Practices | i



Safety Assurance: Three-Tiered Model – Defense In Depth

Quality Control (QC)

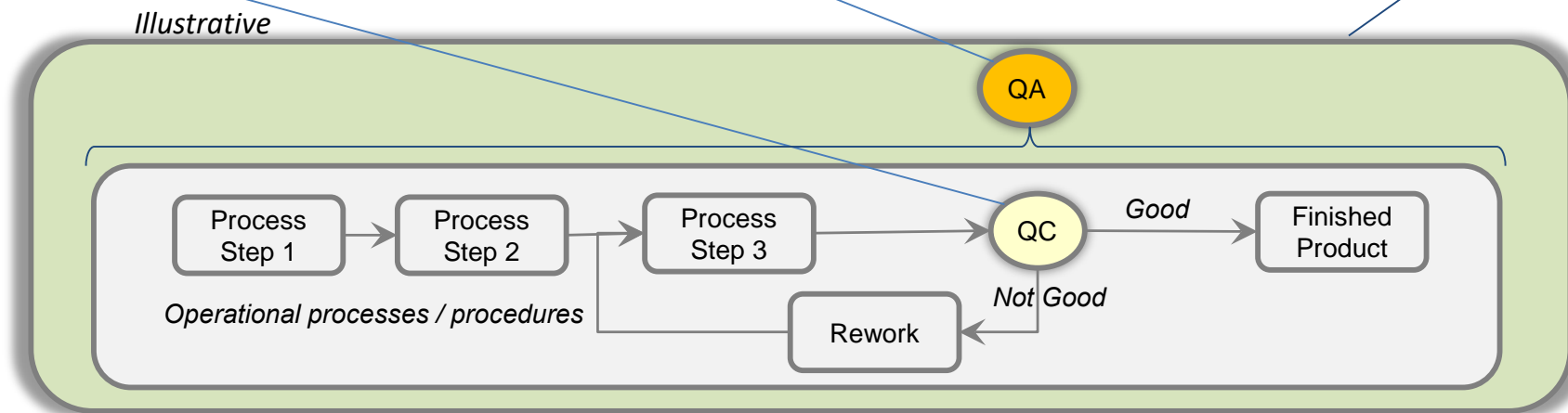
- QC evaluates quality outcomes within process (e.g. step level);
- Enables defects to be identified, corrected, and prevented in real-time
- Embedded within process
- Performed by process expert
- Fix errors before completion

Quality Assurance (QA)

- QA evaluates overall process outcomes (e.g. leak survey, Cathodic Protection, etc.)
- Establishes confidence that overall results achieve the desired level of quality
- External to process
- Performed by Quality / process improvement expert

Audit

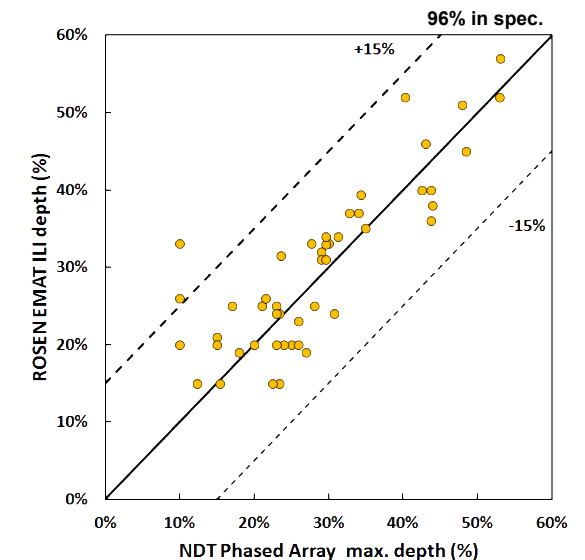
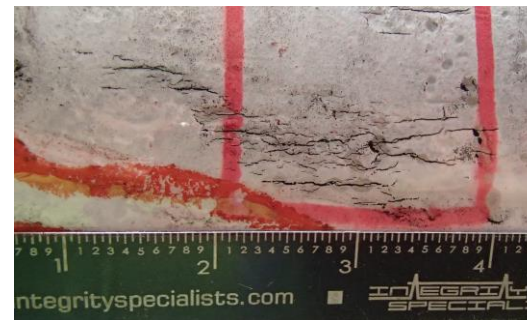
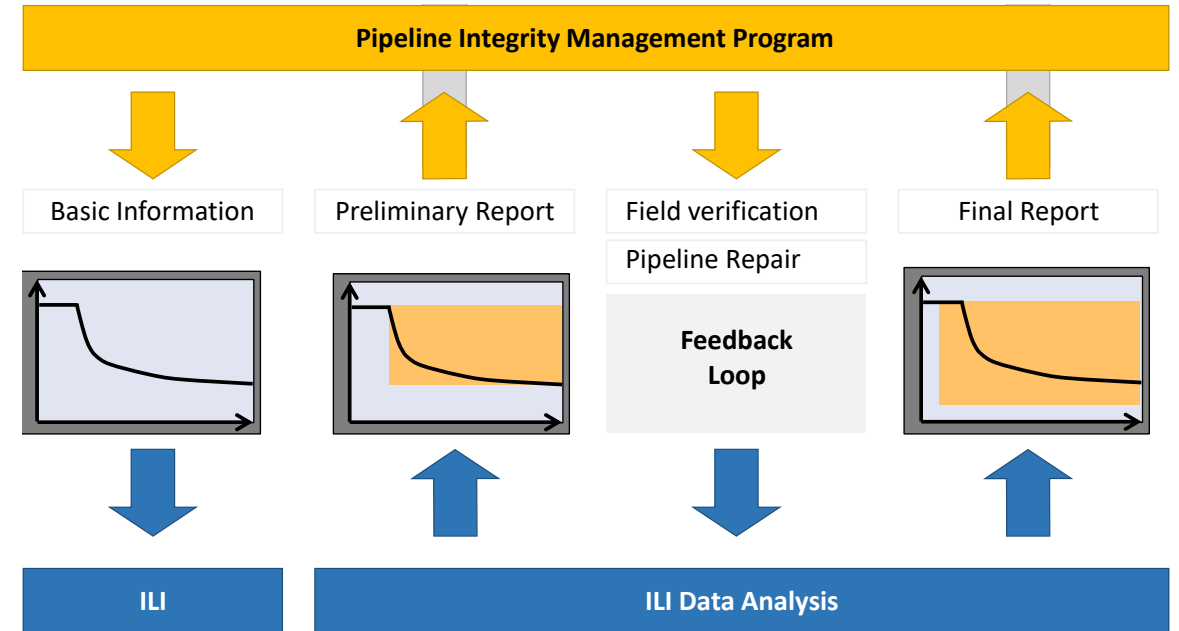
- Audit samples Quality Assurance plan and confirms adherence and quality levels
- Conducted after QC and QA have completed their tasks
- Documentation review validates adherence to procedures



Integrity Assessments: In-Line Inspection

- ILI Lead Tech and Analyst - ensure adherence to specifications
 - Quality Control
 - Key control parameters
 - *Operational Controls*
- Operator - evaluate quality
 - Excavations
 - Quality Assurance
 - *Safety Assurance*
- Oversight – audit of quality
 - *Safety Assurance*

In-Line Inspection is a Process



Leadership

- Adherence to specifications and procedures
- Stop work authority - pause
- Management of change
- Constant vigilance - take nothing for granted
- Ownership and pride

Top Management
Management
Recognized Leaders

Essential Safety Management System Elements



Safety and Quality Are The Price of Entry

Thank you.

Mark Hereth

MLH@P-PIC.COM

713.294.6650



INGAA



FOUNDATION

30 YEARS OF EXCELLENCE

EFFECTIVE MESSAGING & COMMUNICATIONS STRATEGIES

Dr. Chris Kofinis, CEO, Park Street Strategies

Nichole Francis Reynolds, VP of Government & Public Affairs, INGAA





INGAA



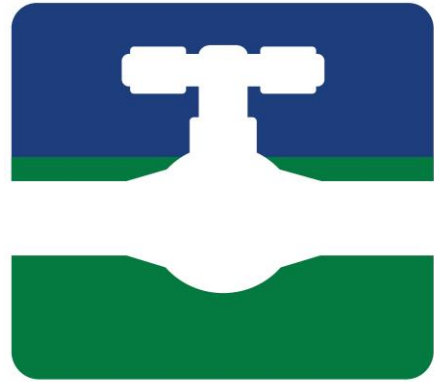
FOUNDATION

30 YEARS OF EXCELLENCE

BREAK

Please return in 15 minutes





INGAA

FOUNDATION

30 YEARS OF EXCELLENCE

THE ROLE OF NATURAL GAS IN FUTURE ENERGY SYSTEMS

Dr. Naomi Boness

Managing Director, Natural Gas Initiative

Stanford University



The Role of Natural Gas in Future Energy Systems

Naomi L. Boness

Stanford University

Managing Director, Natural Gas Initiative



INGAA Foundation Annual Meeting
November 1, 2019

Stanford Natural Gas Initiative (NGI)

Natural gas research to unlock social, economic and environmental potential

*A collaboration of more than **40 Stanford research groups** drawn from engineering, science, policy, politics, and business disciplines and a **consortium of industry partners***



NGI Members

Sustaining Members



Corporate & Contributing Members



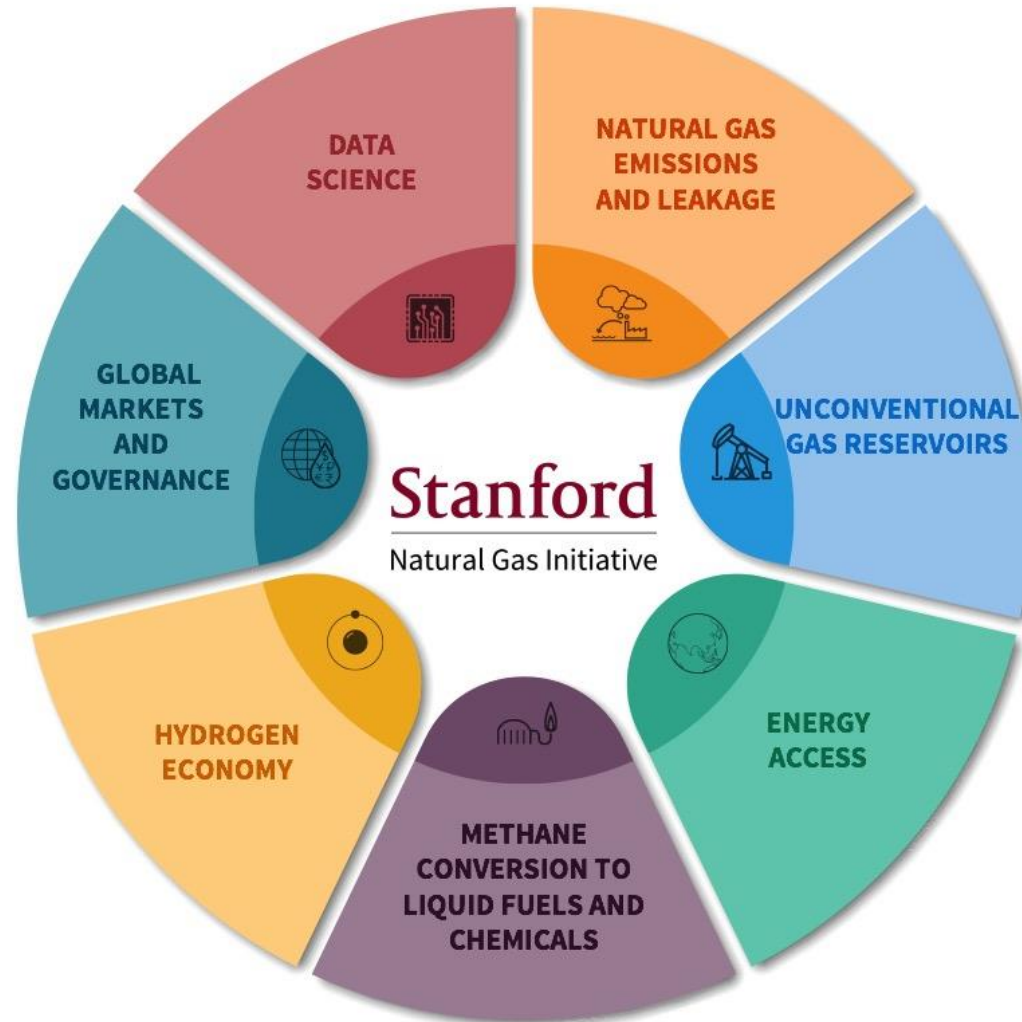
Basic Members



Stanford Natural Gas Initiative (NGI)

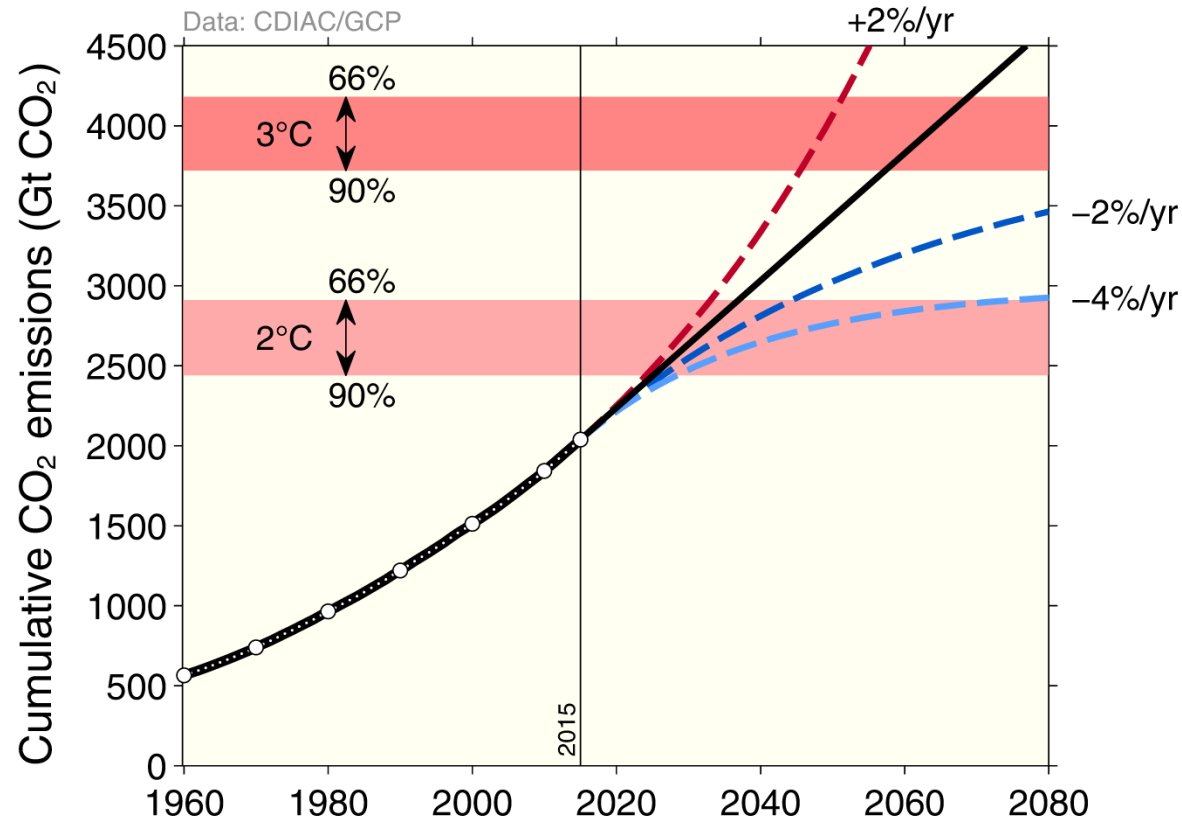
Natural Gas Research & Innovation

Mission: Generate the knowledge needed to use natural gas to its greatest social, economic, and environmental benefit.



The Need to Decarbonize the Energy System is Beyond Dispute

Overwhelming **Scientific** Evidence

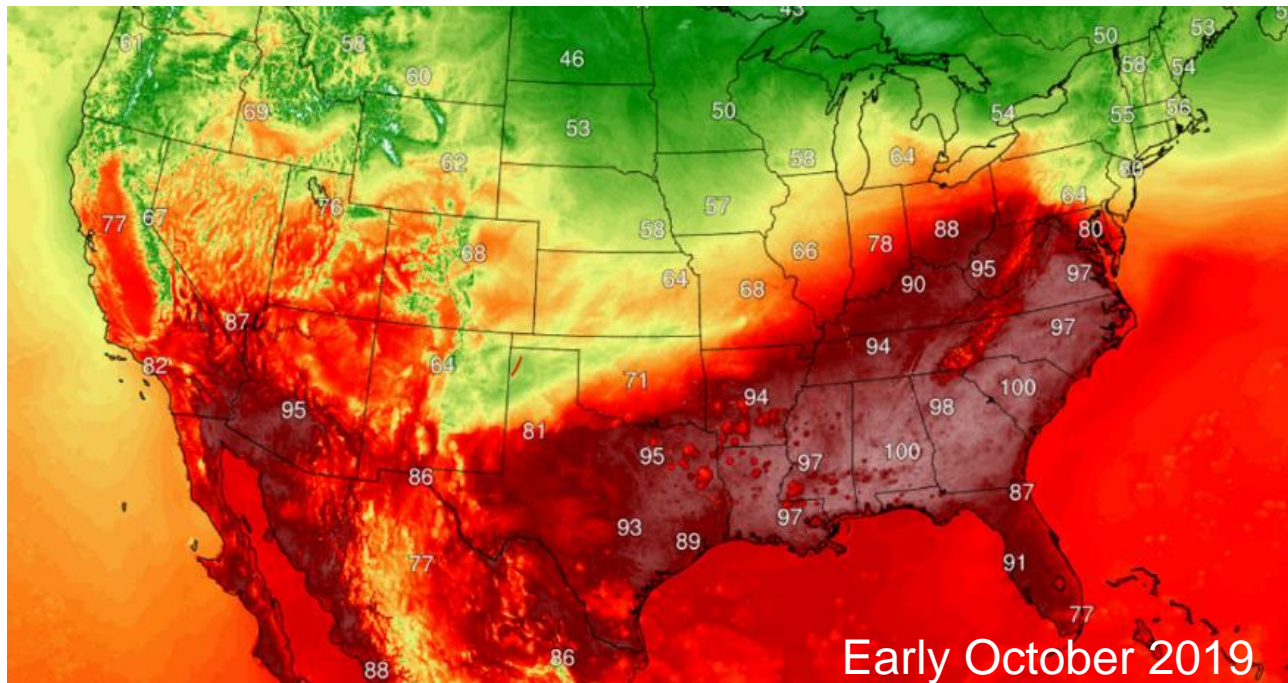


- The red shaded areas are the chance of exceeding different temperatures above pre-industrial levels using the cumulative emissions concept
- Source: [Jackson et al 2015b](#); [Global Carbon Budget 2015](#)

The Good News: To Limit Warming to ~2°C, About 4% per Year Reductions in Emissions Will be Needed

The Need to Decarbonize the Energy System is Beyond Dispute

Overwhelming **Scientific** Evidence
Overwhelming **Observational** Evidence



The Need to Decarbonize the Energy System is Beyond Dispute

Overwhelming **Scientific** Evidence
Overwhelming **Observational** Evidence



The Need to Decarbonize the Energy System is Beyond Dispute

Overwhelming **Scientific** Evidence
Overwhelming **Observational** Evidence
Overwhelming **Global** Engagement



6 Million People Worldwide

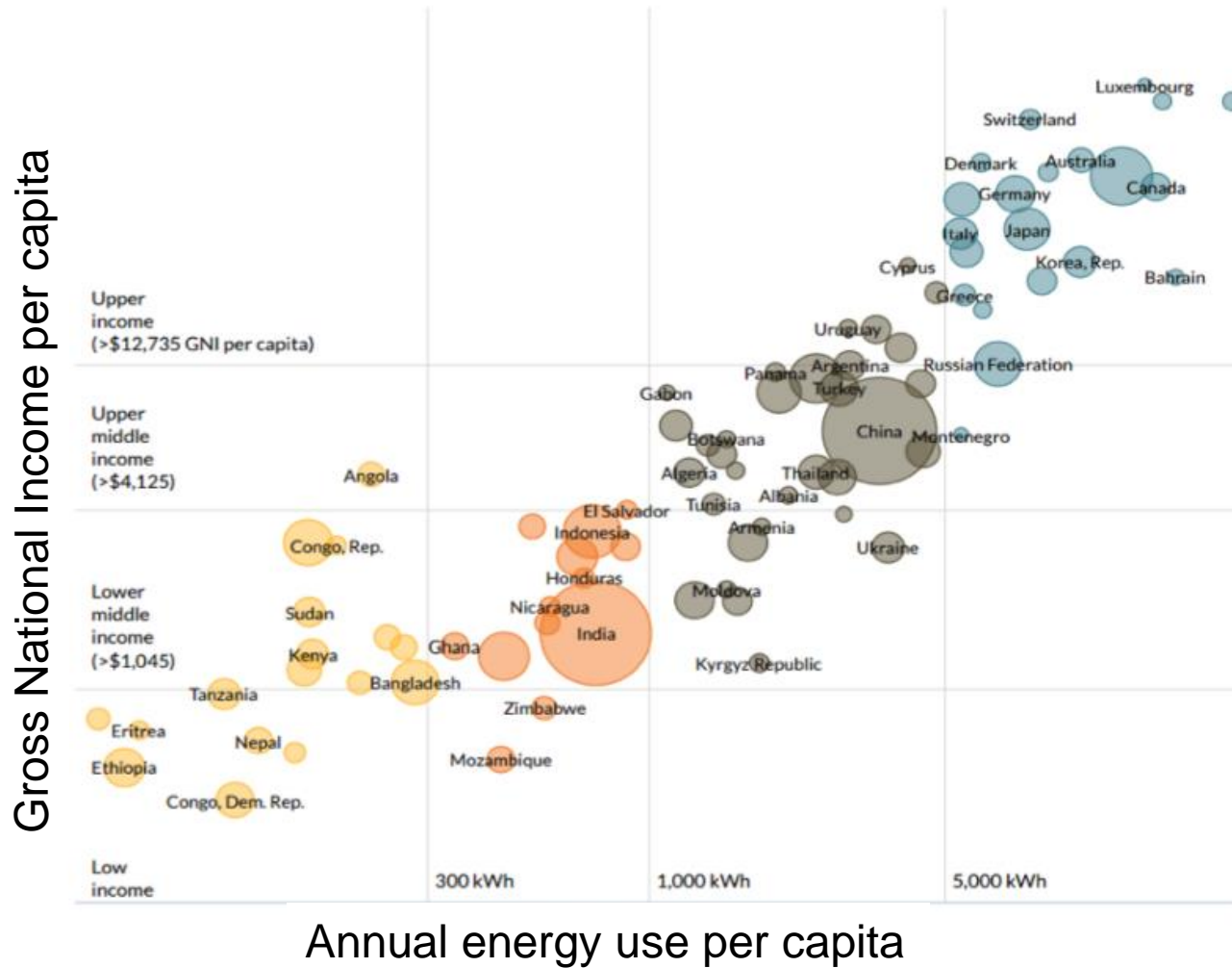
The Need to Decarbonize the Energy System is Beyond Dispute

Overwhelming **Scientific** Evidence
Overwhelming **Observational** Evidence
Overwhelming **Global** Engagement
Overwhelming **Business** Opportunities



- \$3 Trillion public investment in renewable energy (over half of new energy investments are for renewables)
- Climate change laws and policies have doubled in the past 5 years

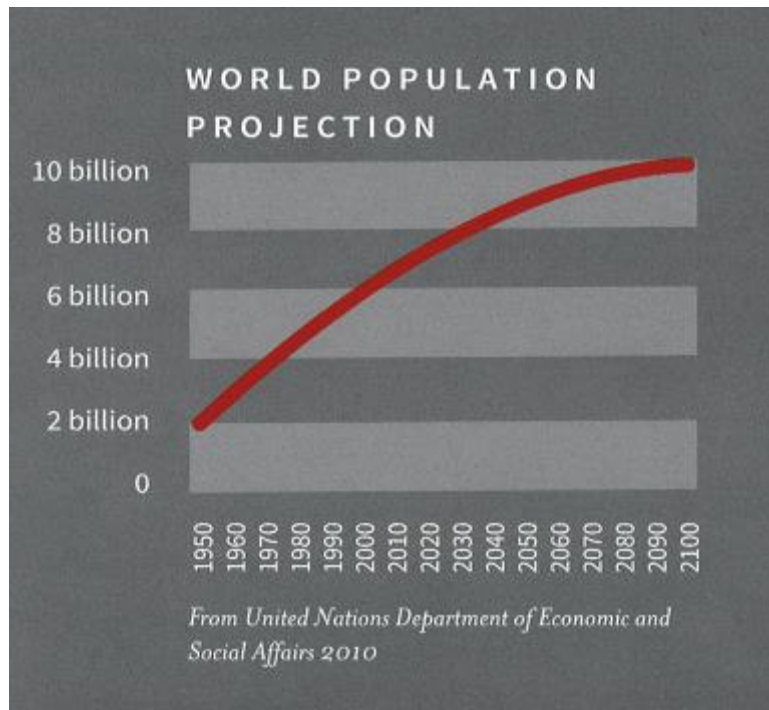
The World Needs Energy - Energy Access Correlates Strongly With Economic Development



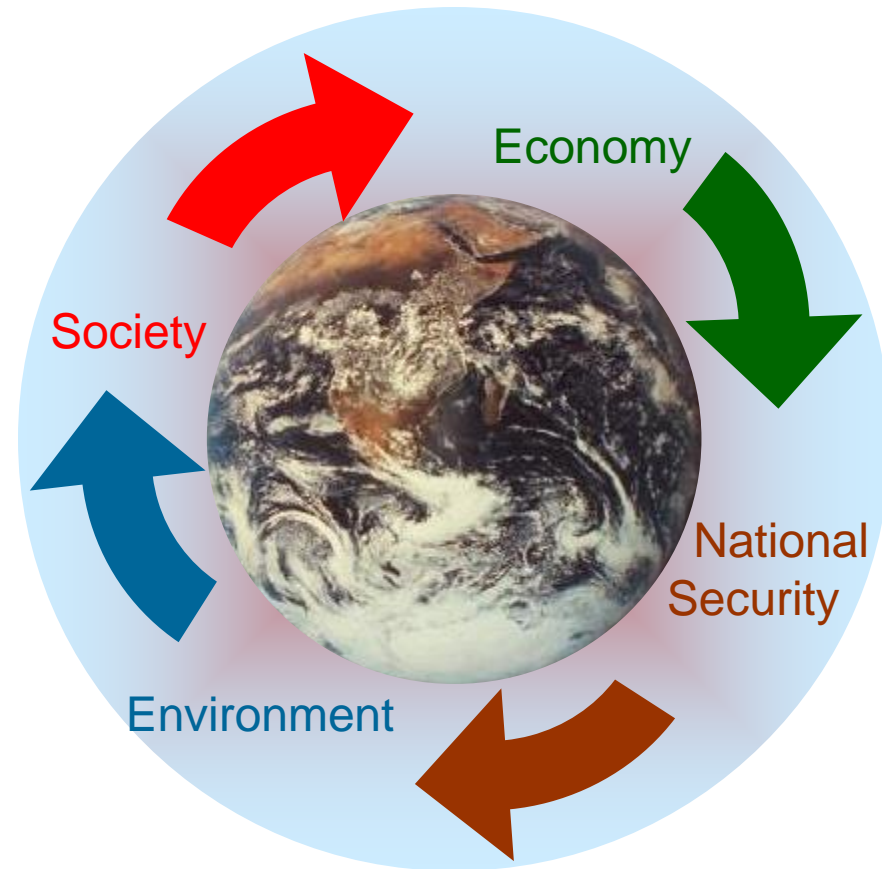
The height of hypocrisy is to deny energy and the aspiration of economic growth to developing countries because of our current decarbonization goals

Global Energy and Environment Challenge

The World in 2050



~ 9 Billion People

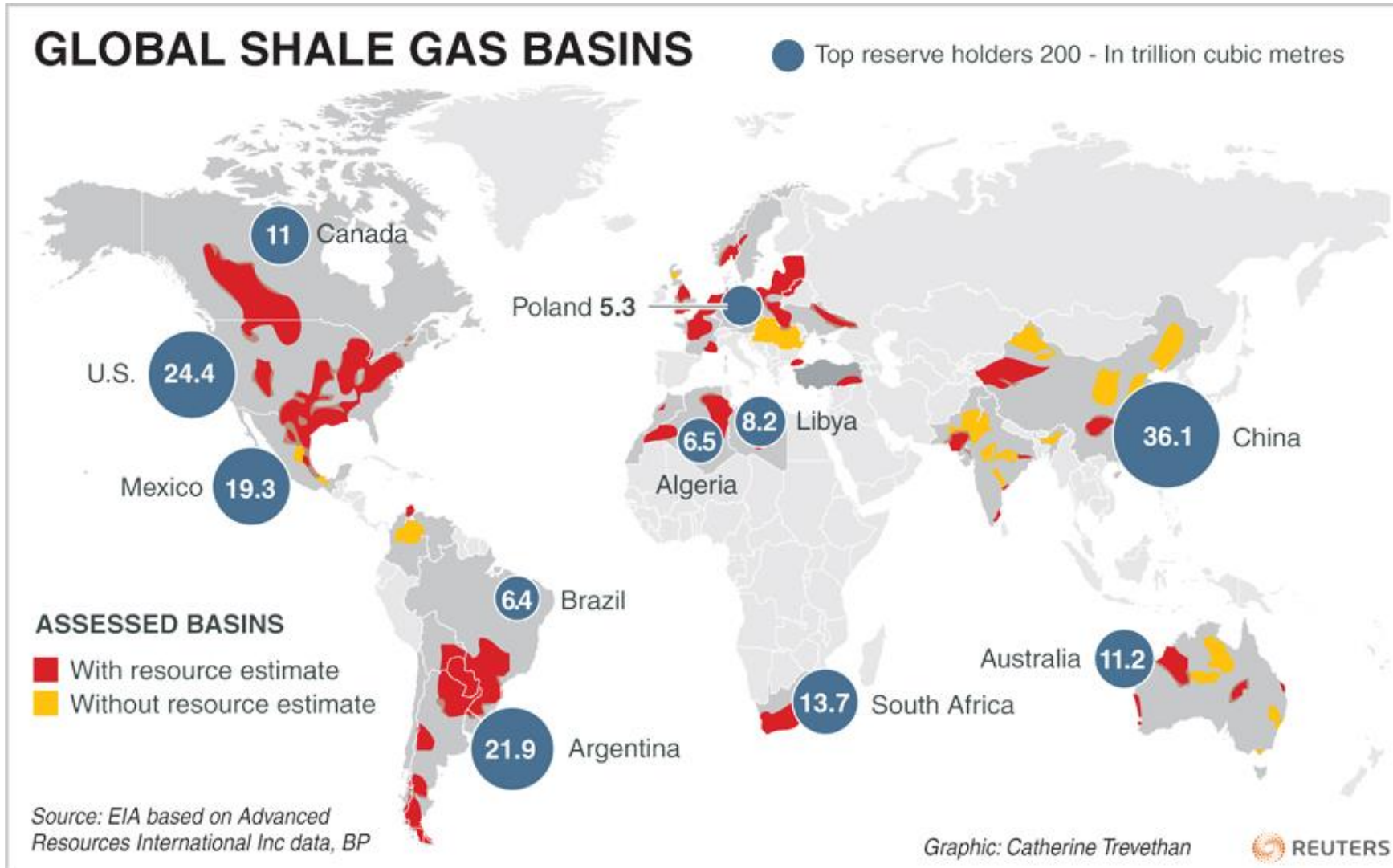


How Will We Provide Almost Twice As Much Accessible, Affordable, and Secure Energy, While Protecting the Planet?

Natural Gas in the Era of Decarbonization

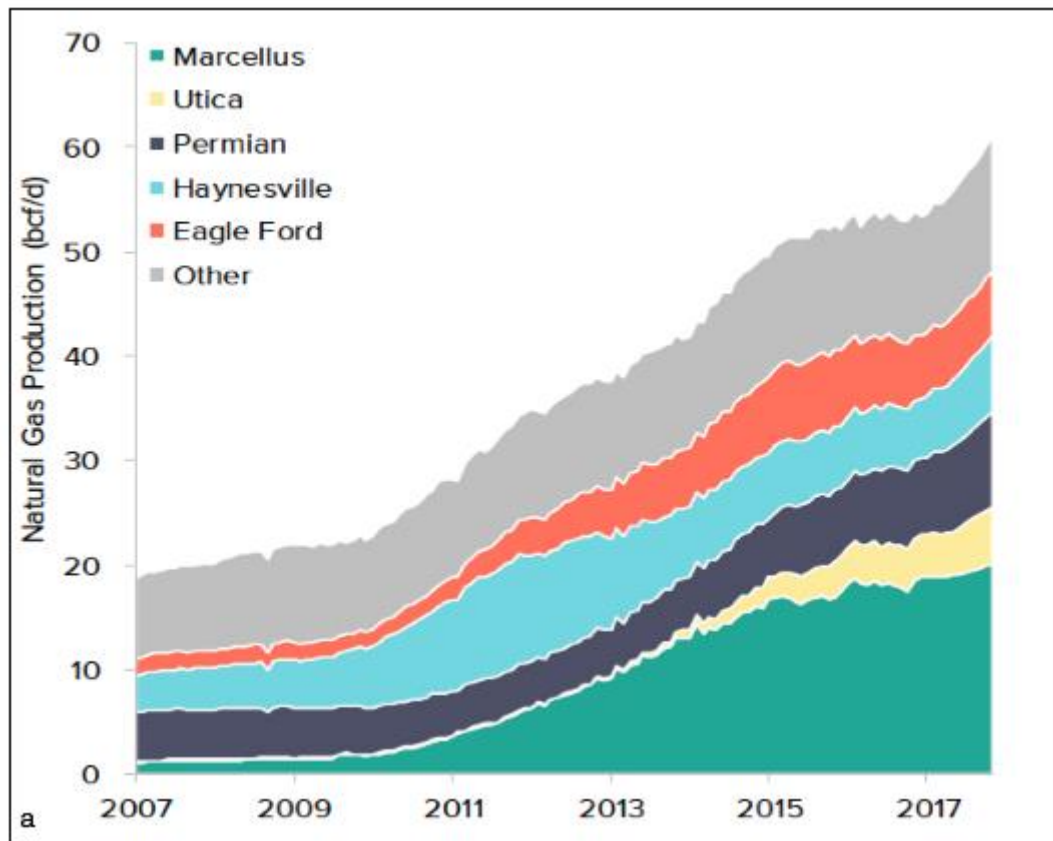
- The Unconventional Revolution, and the “New Global Abundance” of Natural Gas, Provide Immediate Opportunities for Decarbonization of the Electrical Power Sector Through Fuel Switching in Many Countries Around the World
- Natural Gas and Natural Gas Liquids Are Needed to Provide a Thermal Fuel for the Developing World
- Natural Gas Will Continue to be a Critical Component of Energy Systems in Rapidly Decarbonizing Economies (Such as California) for Decades to Come
- The Oil and Gas Industry Must Play a Major Role in Achieving the CO₂ Emission Reductions Needed to Meet the Objectives of the Paris Accords

Global Natural Gas ~ 200 Years of Supply

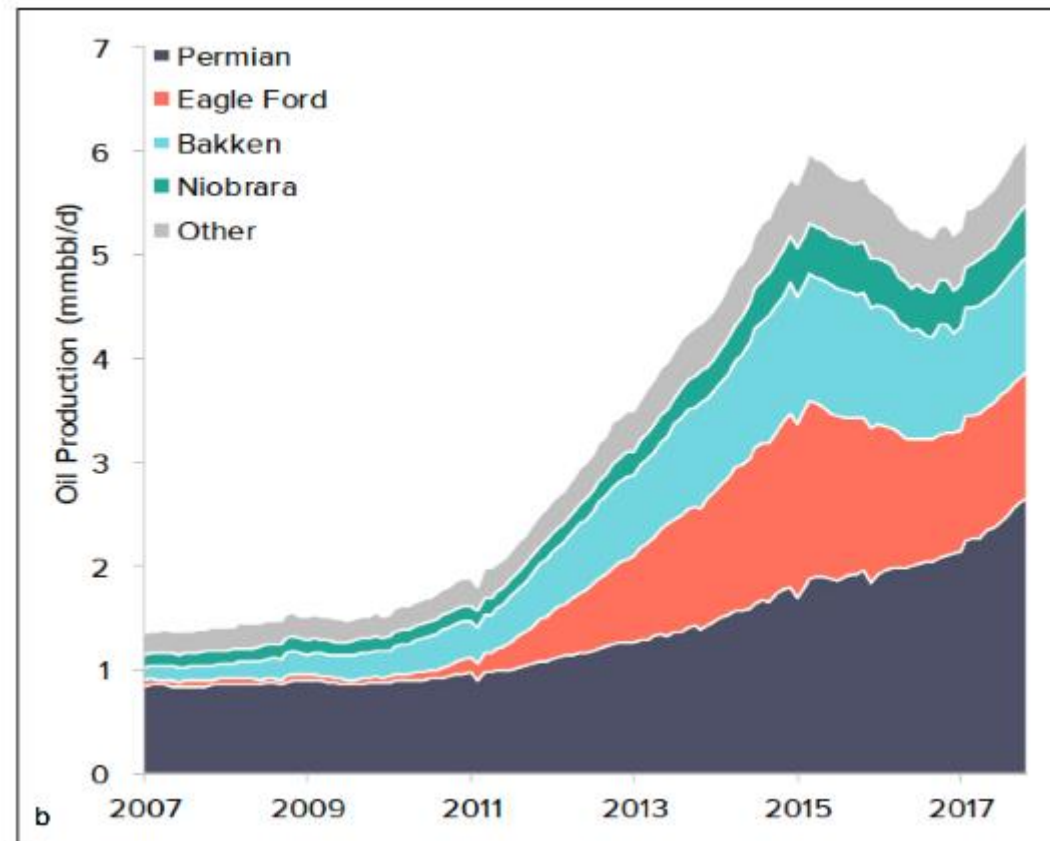


The Unconventional Revolution

U.S. Gas

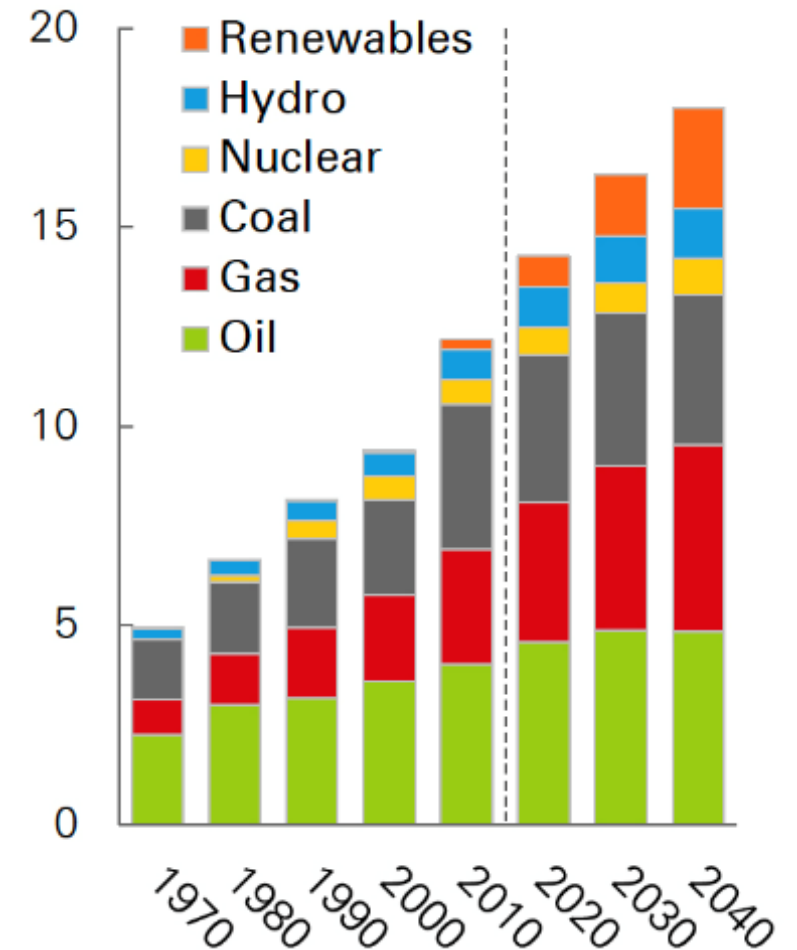


U.S. Oil



Energy in 2040

- Oil and coal remain approximately constant, new energy from natural gas and renewables
- Similar Estimates from Other Major Oil Companies; U.S. Dept. of Energy (EIA); and International Energy Agency (IEA)

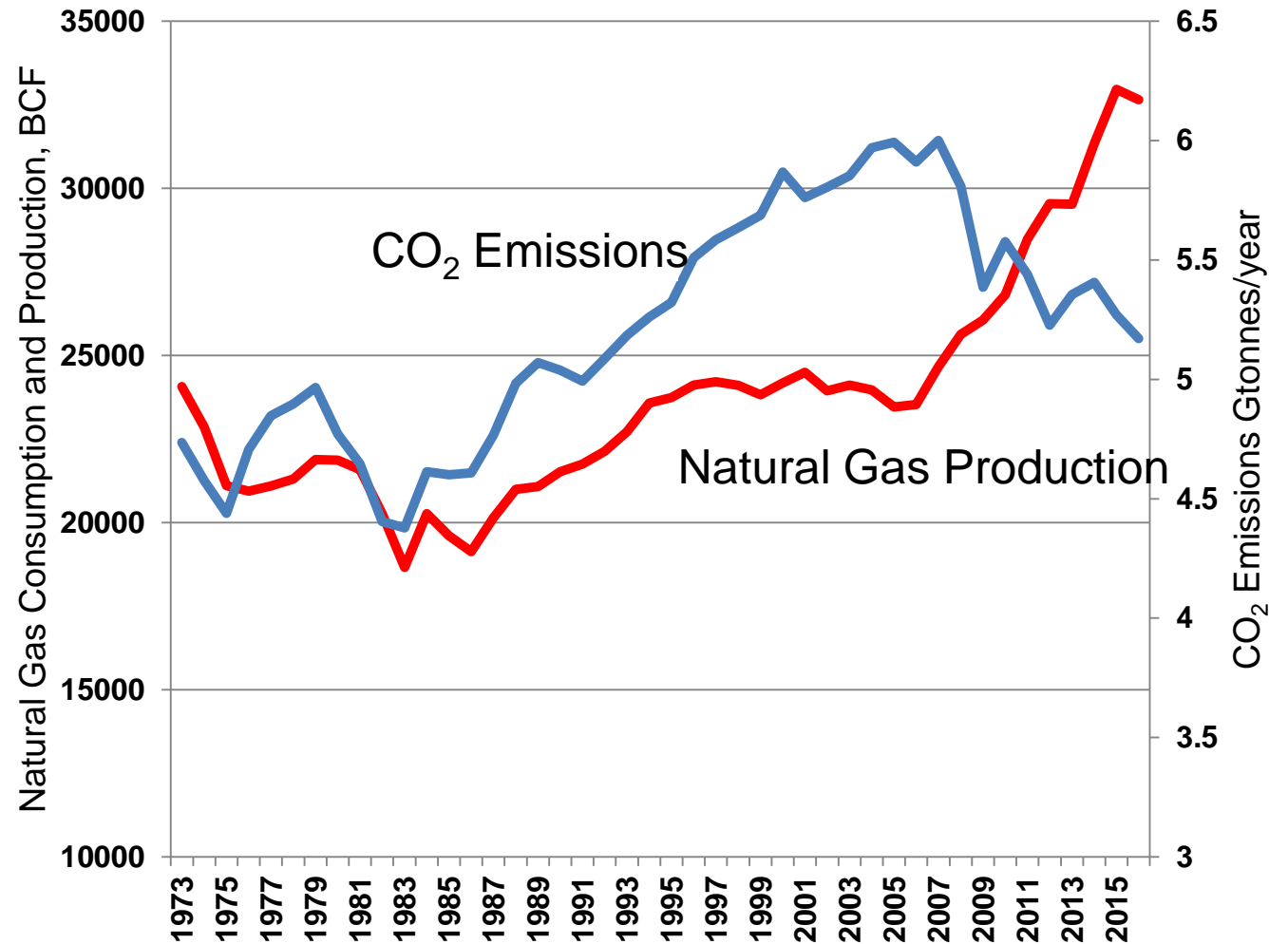
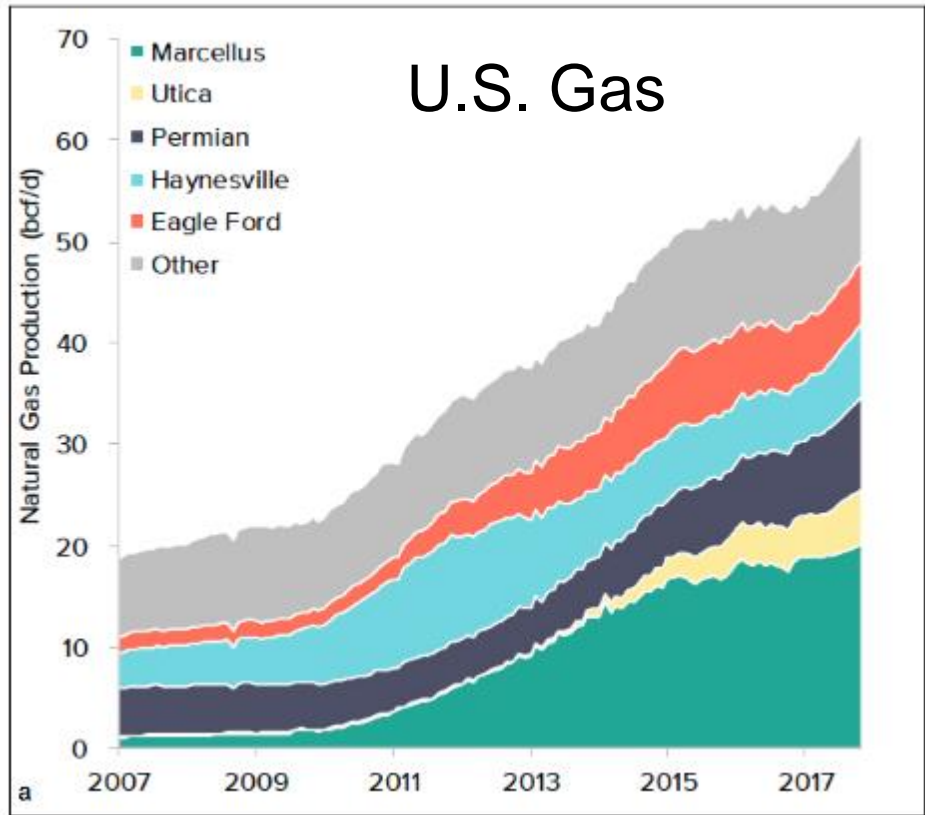


2018 BP Energy Outlook



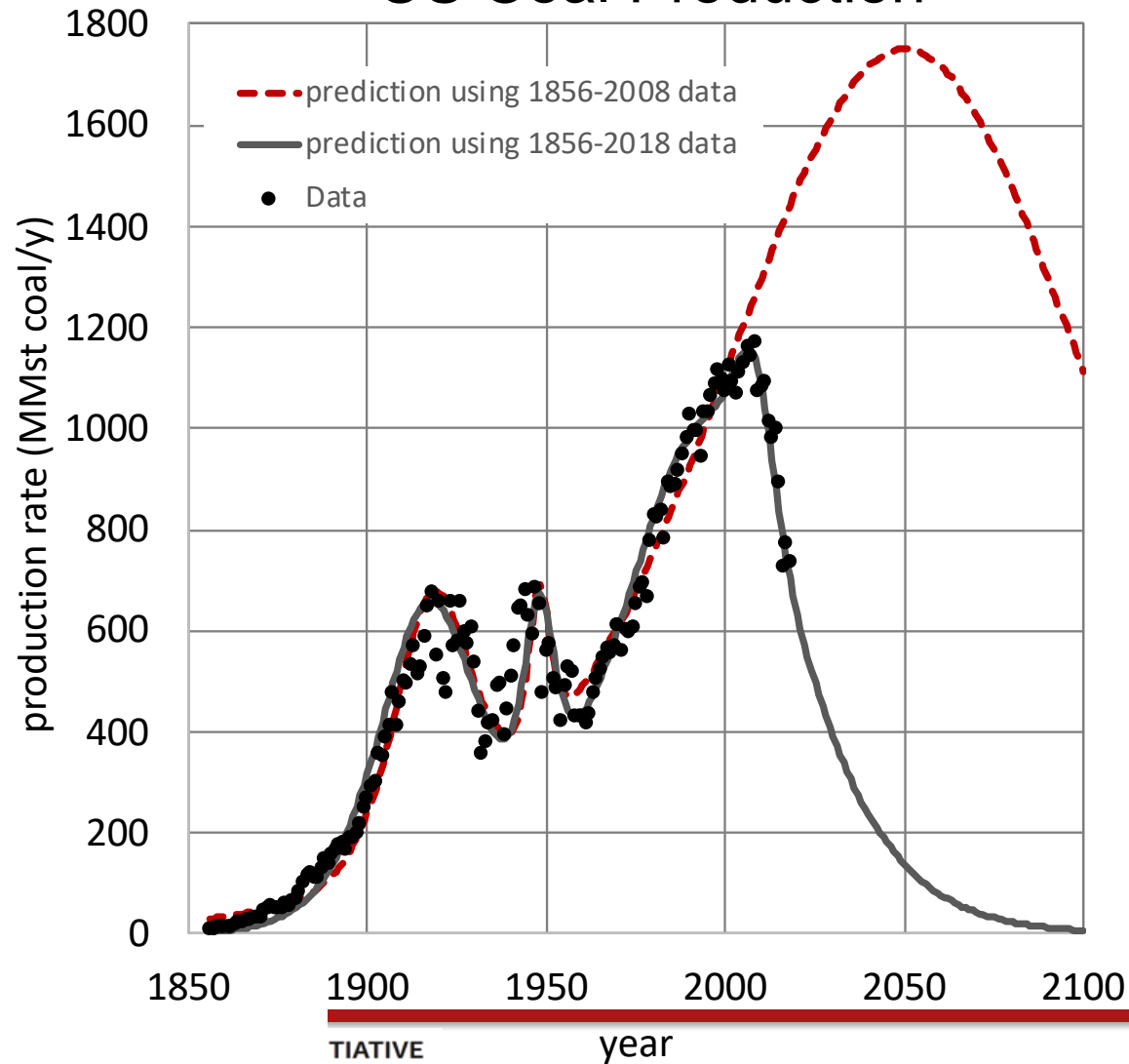
Fuel Switching Works!

The Unconventional Gas Revolution

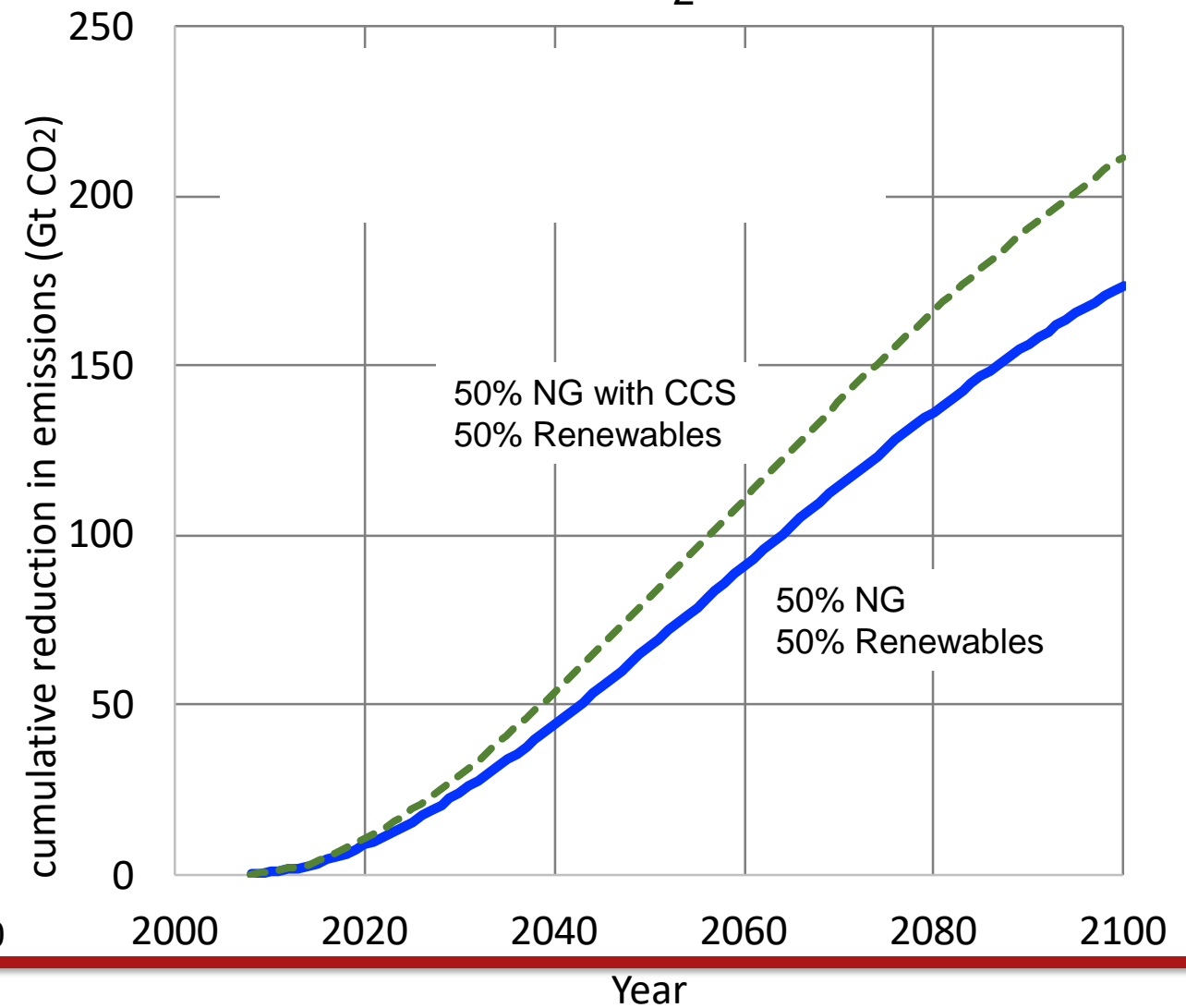


Switching From Coal to Natural Gas in the U.S.

US Coal Production

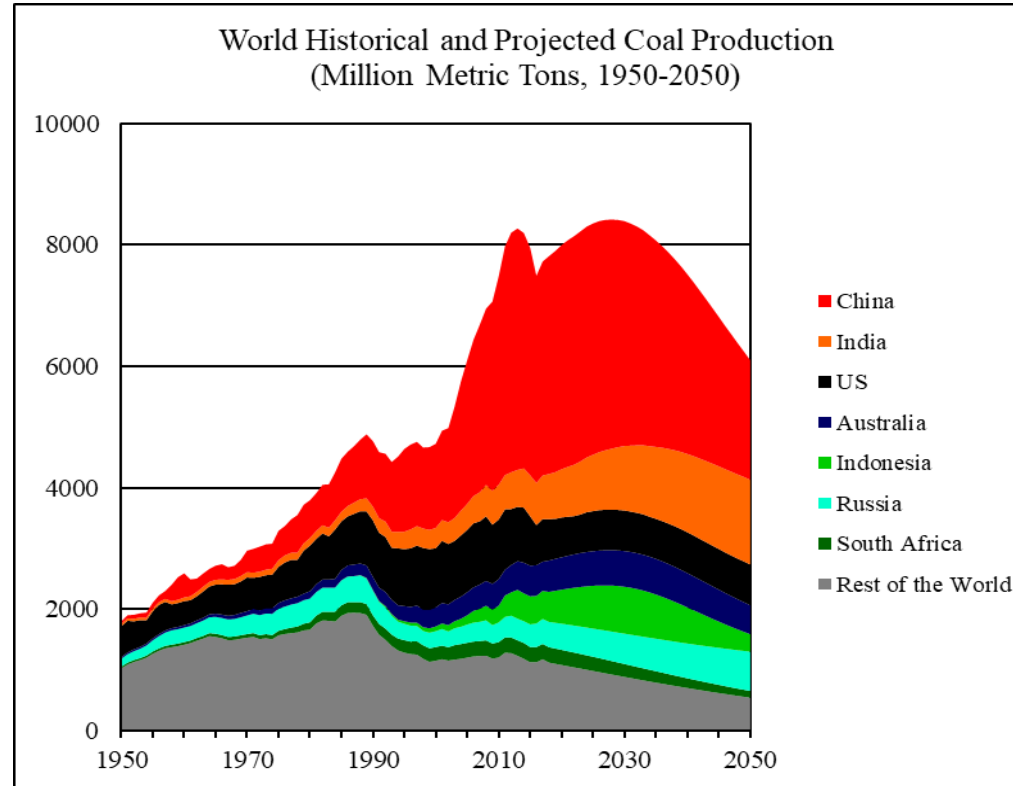
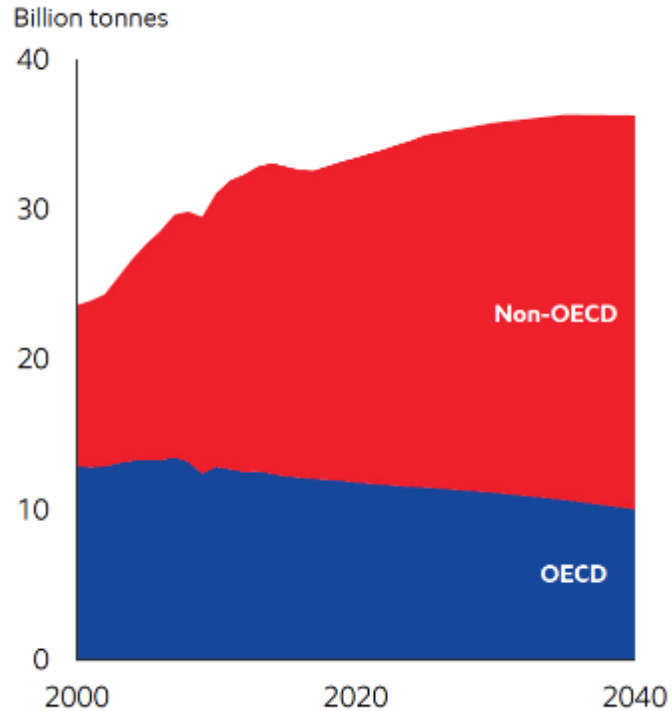


Avoided CO₂ Emissions



Critical Need to Limit Future CO₂ Emissions from Coal

Energy-related CO₂ emissions



~300 Gigawatts of Coal Generation Capacity Under Construction in Asia

Coal provides ~38% of global power, but generates ~75% of emissions

How Do we Make Natural Gas (LNG) Cheaper Than Coal?

Even a Low Price on Carbon Works!

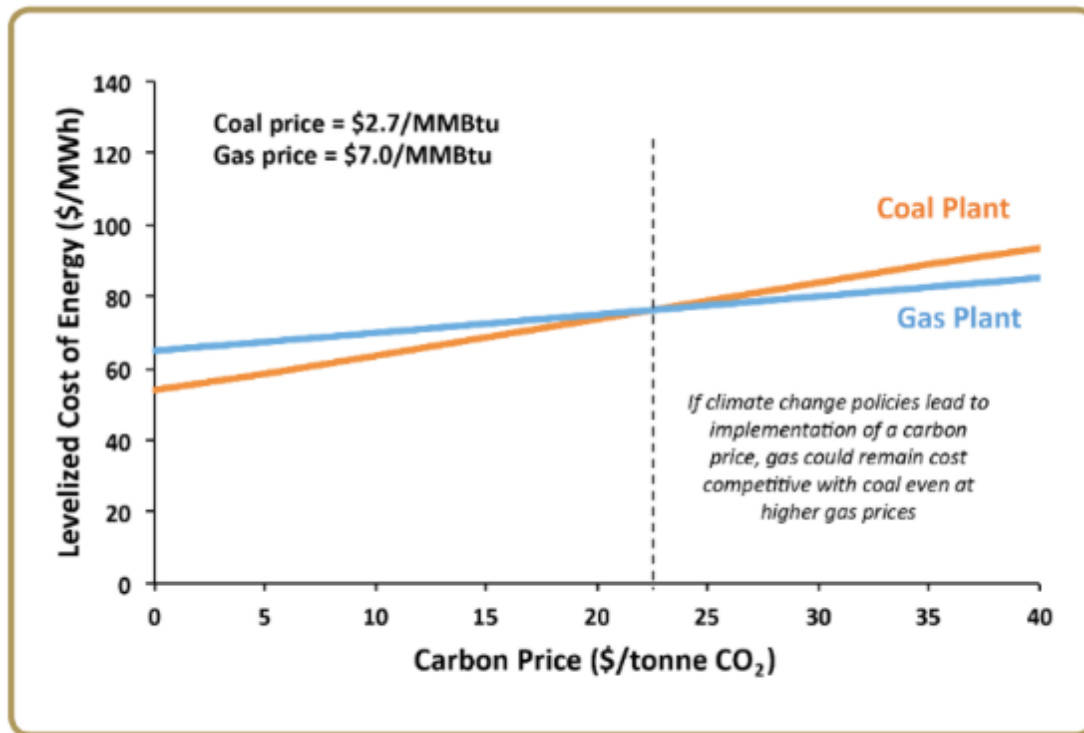


Figure 2: Effect of carbon price on economics of coal- vs. gas-fired power



Stanford | Natural Gas Initiative
School of Earth, Energy & Environmental Sciences
and Precourt Institute for Energy

SEPTEMBER 2016

ABOUT THE AUTHOR

MARK C. THURBER

Mark C. Thurber is associate director of the Program on Energy and Sustainable Development (PESD) at Stanford University. He edited and contributed to *The Global Coal Market: Supplying the Major Fuel for Emerging Economies*. This 2015 book examines how policies toward coal in the most important coal-producing, consuming, and exporting countries—China, India, Indonesia, Australia, South Africa, and the United States—affect economic and environmental outcomes.



Dr. Thurber also co-edited the 2012 book *Oil and Governance: State-owned Enterprises and the World Energy Supply*, co-authoring chapters on the Norwegian and Nigerian national oil companies and on how the need to manage risk has shaped the global oil and gas industry.

Dr. Thurber teaches a course on energy markets and policy in the Graduate School of Business at Stanford, in which he runs a classroom simulation of energy and carbon markets. He also oversees PESD's work on business models for distributed solar generation in sub-Saharan Africa. Dr. Thurber has experience working in the high-tech industry, with a focus on manufacturing operations in Mexico (where he lived for several years), China, and Malaysia. He holds a Ph.D. from Stanford University and a B.S.E. from Princeton University.

Mark Thurber:
http://pesd.fsi.stanford.edu/people/mark_c_thurber
Natural Gas Briefs:
<https://ngi.stanford.edu/content/ngi-briefs>



Why Isn't Natural Gas in India's Climate Strategy?

Mark C. Thurber

India's energy-related emissions of greenhouse gases (GHGs) are predicted to grow far more than those of any other country between now and 2040. This is a function both of India's low per capita energy consumption and GHG emissions today and its plan to continue to rely on coal to supply the vast majority of its energy. The climate policy commitment that India made in advance of the 2015 Paris Climate Conference—its Intended Nationally Determined Contribution (INDC)—aims to displace significant coal with an ambitious build-out of solar energy. At the same time, India's policymakers still appear to view coal as the only energy source that can reliably support economic growth, and they target a doubling of domestic coal production by 2020.

One energy source that does not appear anywhere in India's INDC is natural gas, despite the fact that gas-fired power plants emit roughly half the CO₂ per unit energy output of coal plants. Just as importantly for India, gas-fired plants are negligible emitters of local pollutants, in contrast with coal plants, whose emissions of sulfur oxides (SO_x), nitrogen

oxides (NO_x), and particulates are a major contributor to air pollution.

Given the theoretical potential of natural gas to displace significant coal in India, why isn't the fuel highlighted in the country's climate strategy? The Indian government is not exactly ignoring gas; it has ambitious plans to grow its natural gas import infrastructure over the next

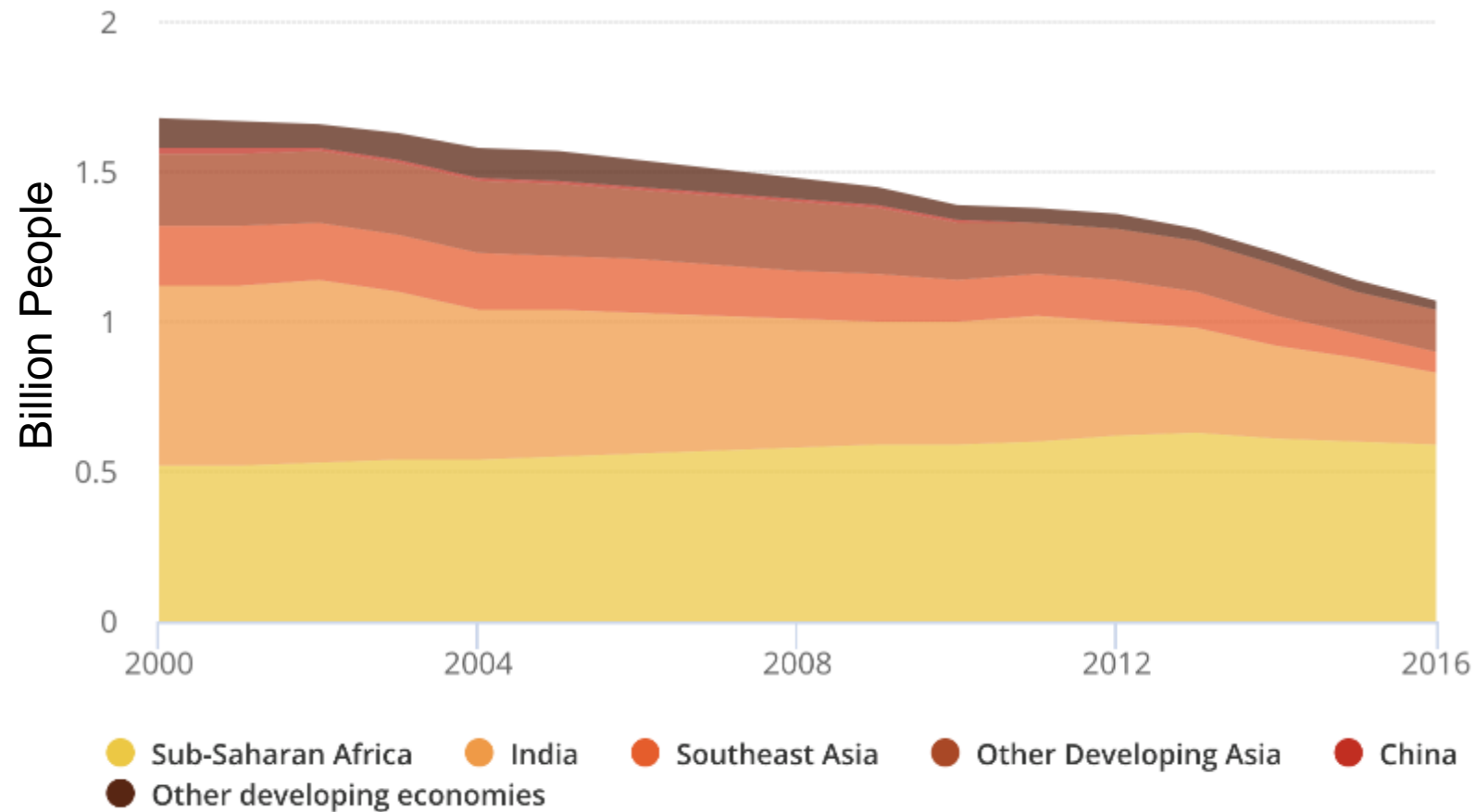
Oil and Gas in the Era of Decarbonization

- The Unconventional Revolution, and the “New Global Abundance” of Natural Gas, Provide Immediate Opportunities for Decarbonization of the Electrical Power Sector Through Fuel Switching in Many Countries Around the World
- **Natural Gas and Natural Gas Liquids Are Needed to Provide a Thermal Fuel for the Developing World**
- Natural Gas Will Continue to be a Critical Component of Energy Systems in Rapidly Decarbonizing Economies (Such as California) for Decades to Come
- The Oil and Gas Industry Must Play a Major Role in Achieving the CO₂ Emission Reductions Needed to Meet the Objectives of the Paris Accords

Energy Poverty is a Reality for Billions of People Every Day



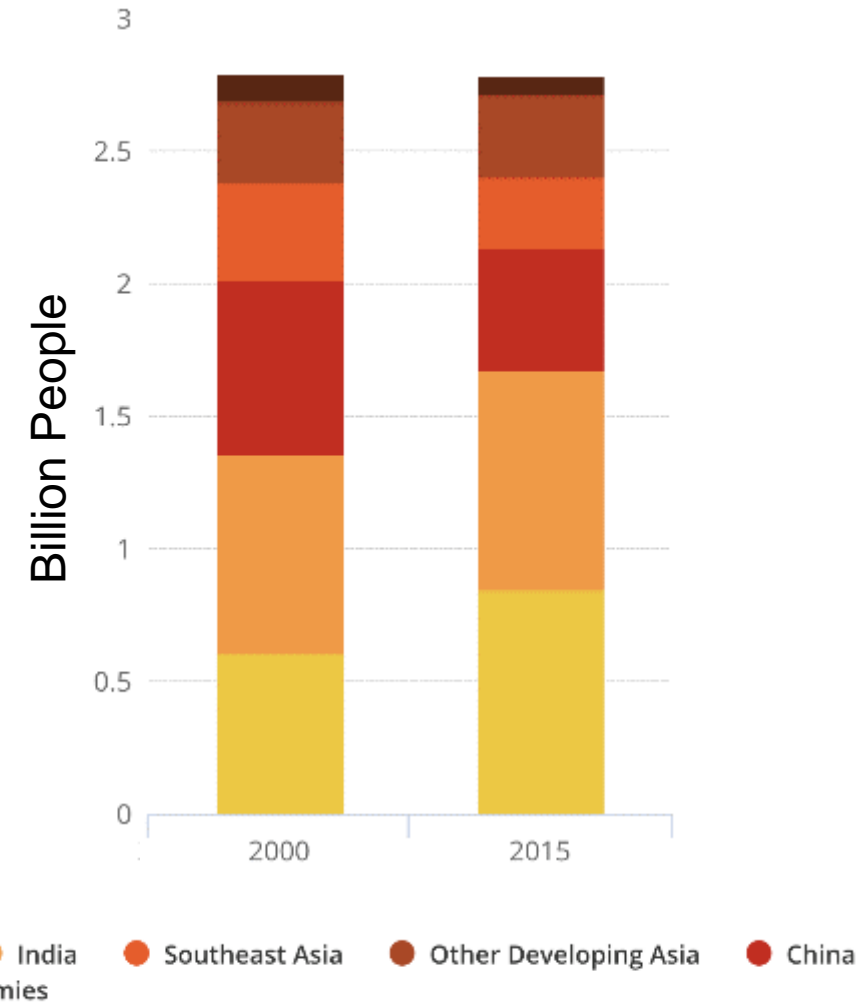
Large Scale and Reliable Sources Of Energy Are Needed for Economic Development



Source: IEA World Energy Outlook, 2017

Acute Need for a Thermal Fuel

2.8 Billion People Require a Clean Thermal Fuel for Cooking and Heating



Source: IEA World Energy Outlook, 2017

Acute Need for a Thermal Fuel



4 Million Deaths per Year
Caused by Indoor Air Pollution*

*More than AIDS, Malaria and
Tuberculosis Combined

Progress Comes In Many Shapes and Sizes



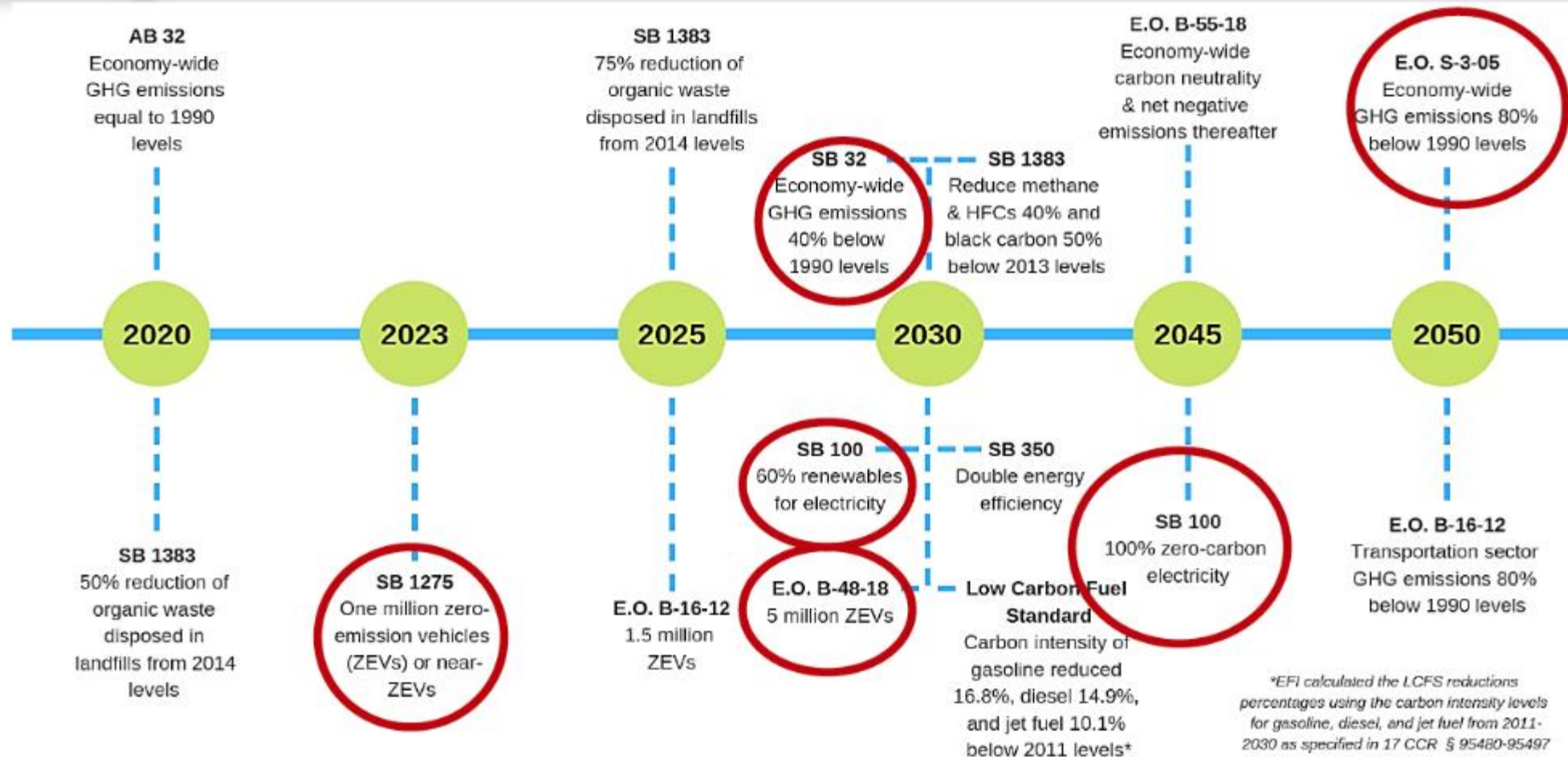
There are >3 Billion Potential Customers in the Developing World for Natural Gas and Natural Gas Liquids



Oil and Gas in the Era of Decarbonization

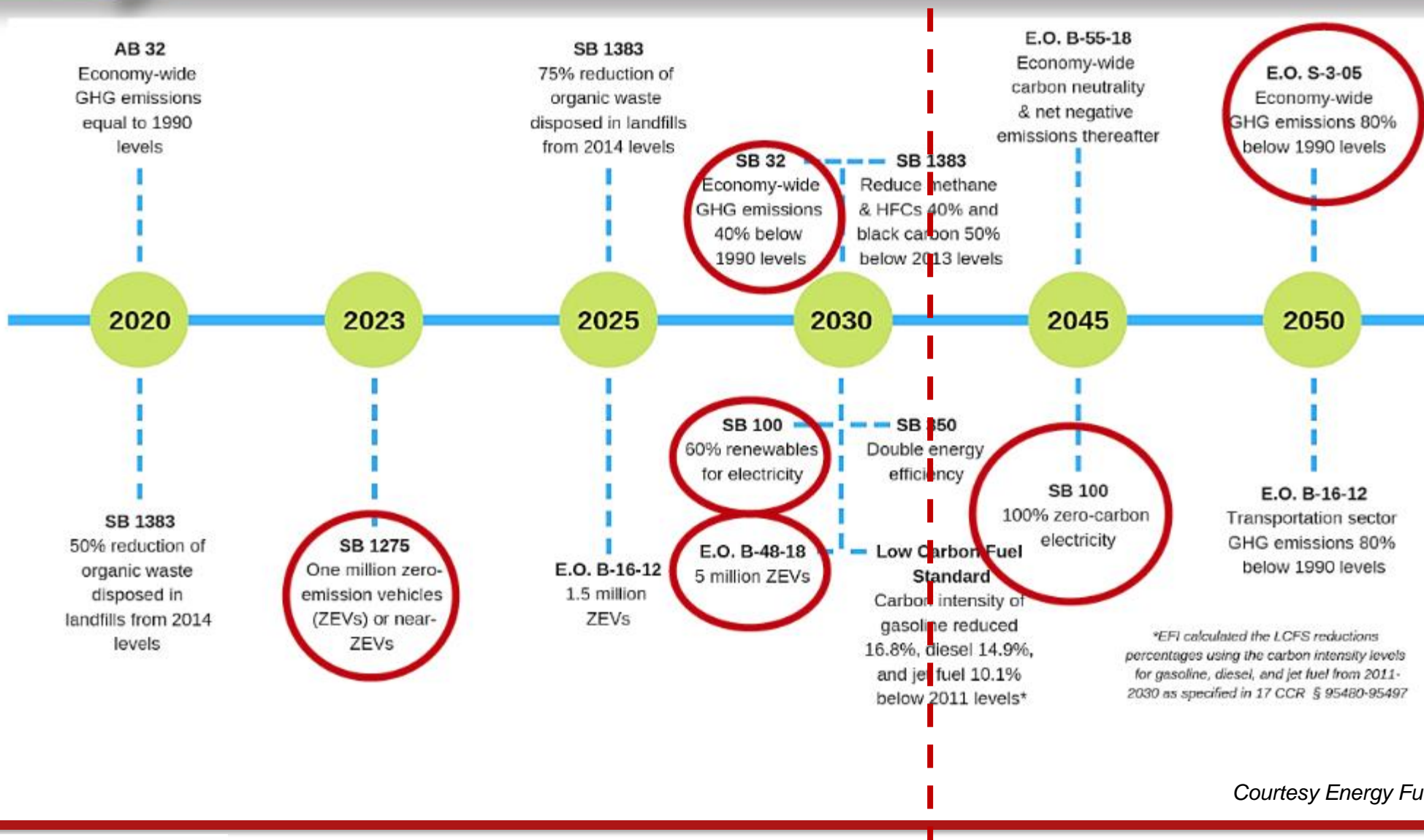
- The Unconventional Revolution, and the “New Global Abundance” of Natural Gas, Provide Immediate Opportunities for Decarbonization of the Electrical Power Sector Through Fuel Switching in Many Countries Around the World
- Natural Gas and Natural Gas Liquids Are Needed to Provide a Thermal Fuel for the Developing World
- **Natural Gas Will Continue to be a Critical Component of Energy Systems in Rapidly Decarbonizing Economies (Such as California) for Decades to Come**
- The Oil and Gas Industry Must Play a Major Role in Achieving the CO₂ Emission Reductions Needed to Meet the Objectives of the Paris Accords

Timeline of Key California Policies for GHG Reductions



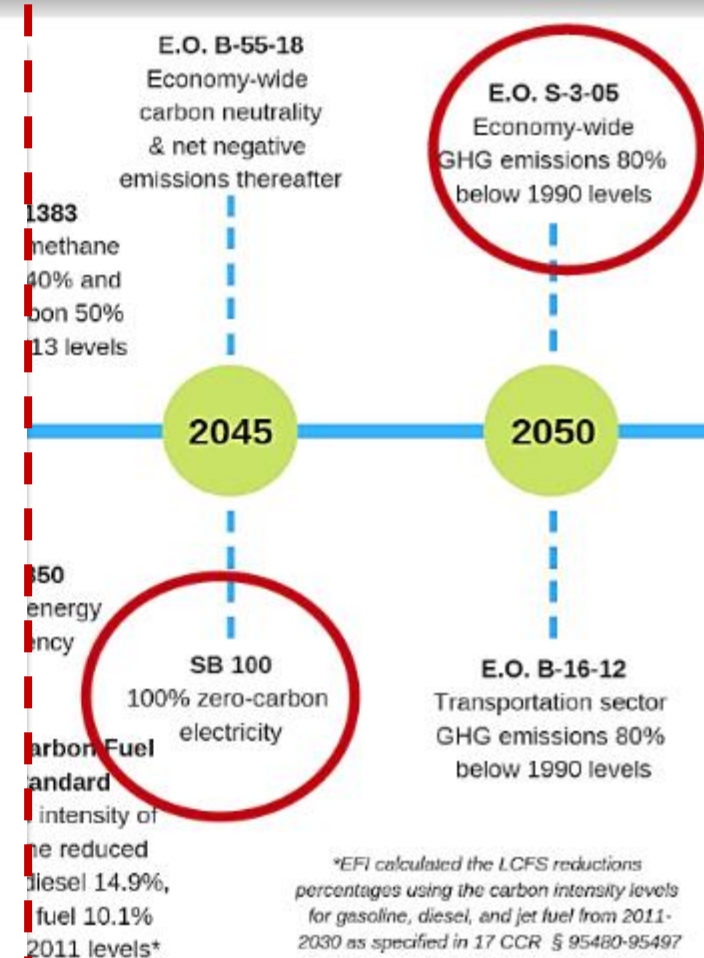
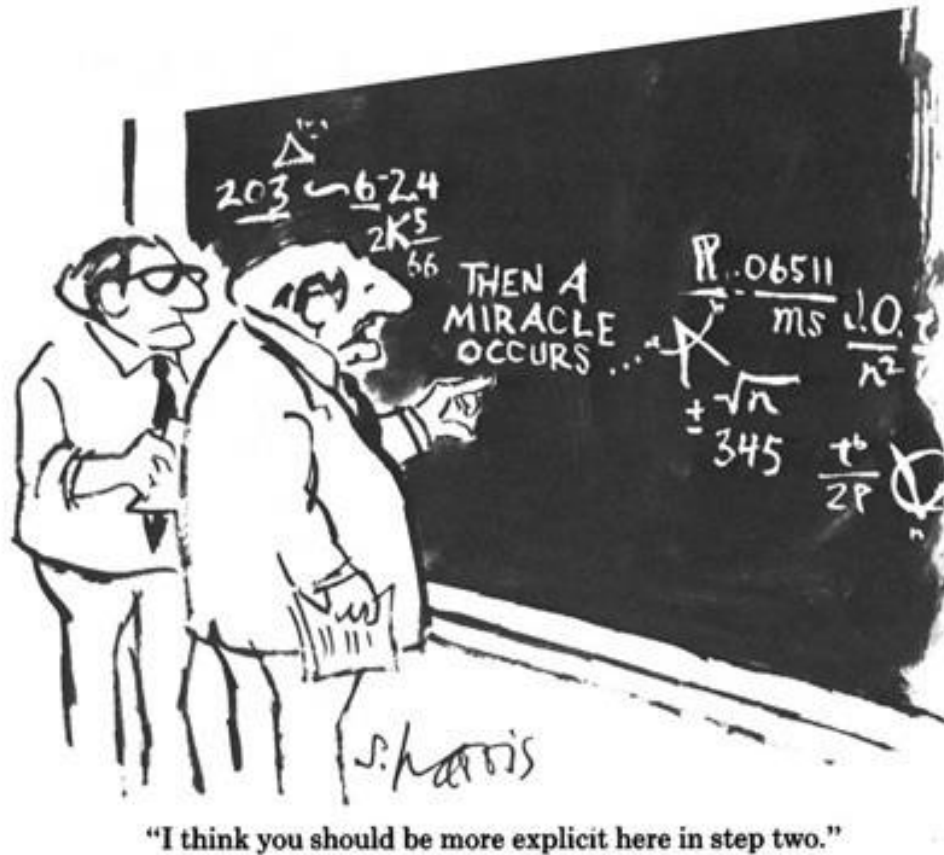
Courtesy Energy Futures Initiative

Timeline of Key California Policies for GHG Reductions



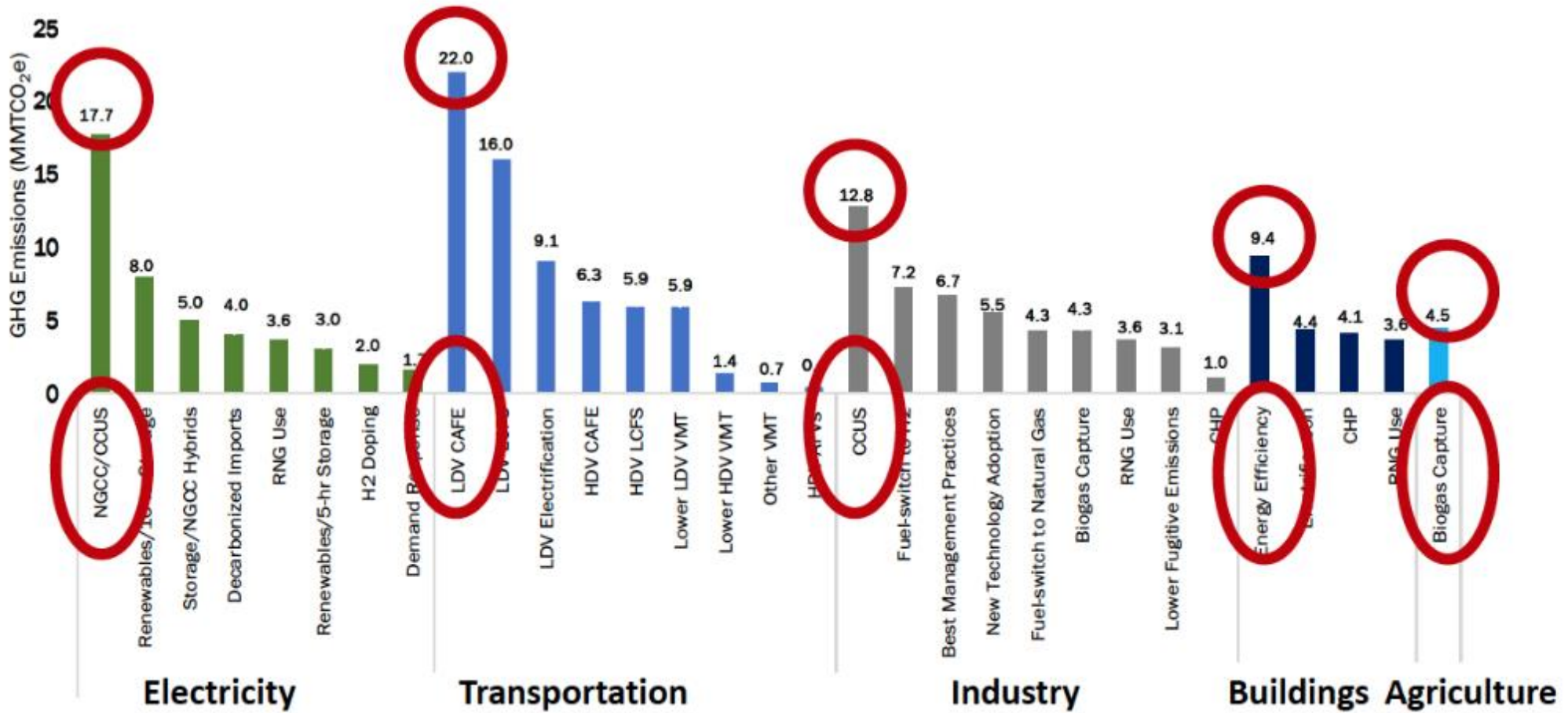
Courtesy Energy Futures Initiative

Timeline of Key California Policies for GHG Reductions



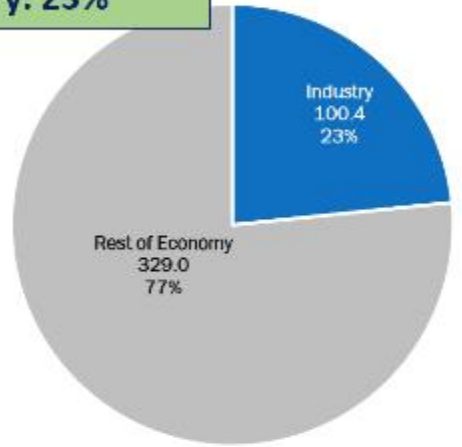
Courtesy Energy Futures Initiative

Identified Emissions Reduction Potential of Sector-Specific Pathways for Meeting the 2030 Targets

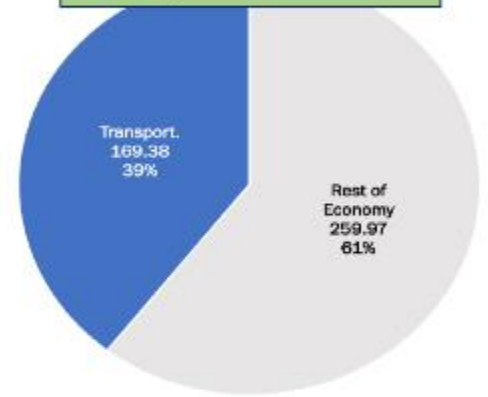


% of Total CO2e Emissions by Sector, 2016

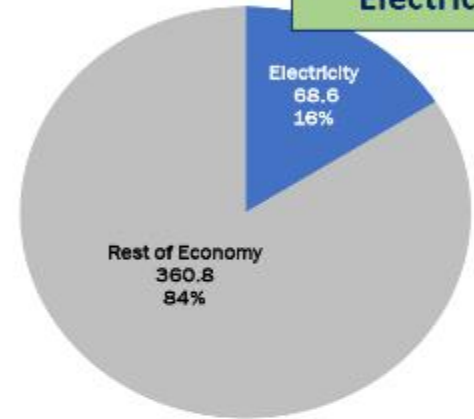
Industry: 23%



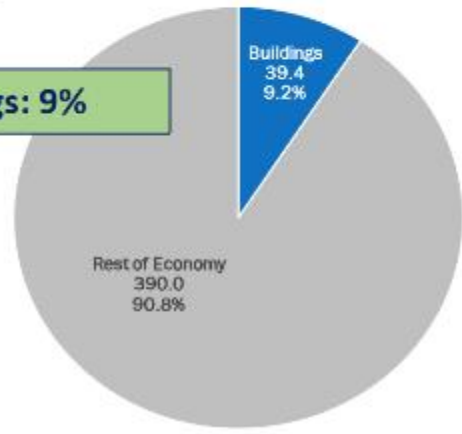
Transportation: 39%



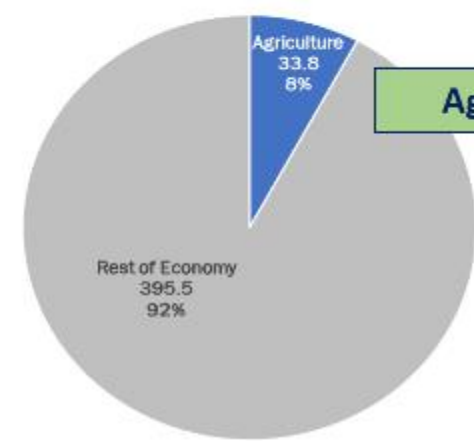
Electricity: 16%



Buildings: 9%



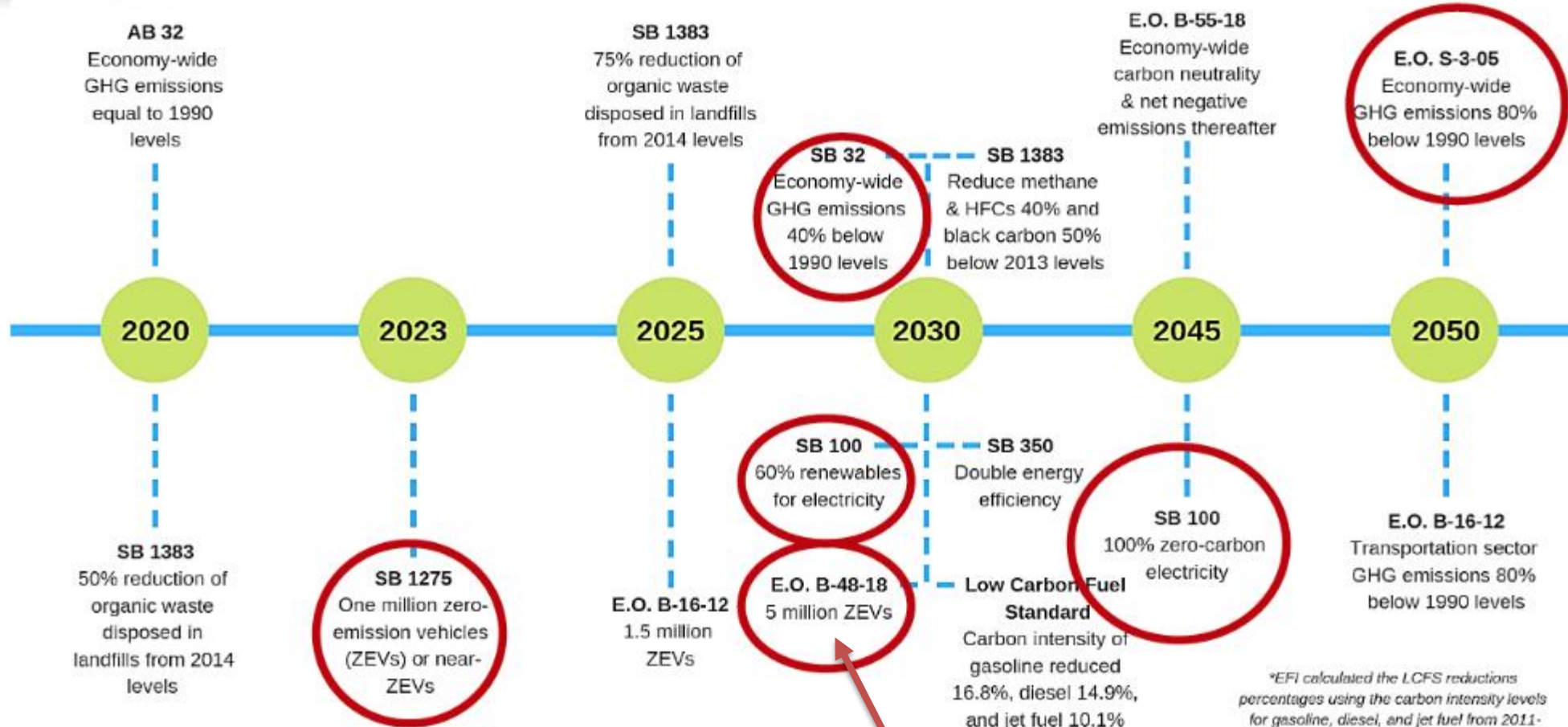
Agriculture: 8%



Source: EFI using data from CARB

Courtesy Melanie Kenderdine

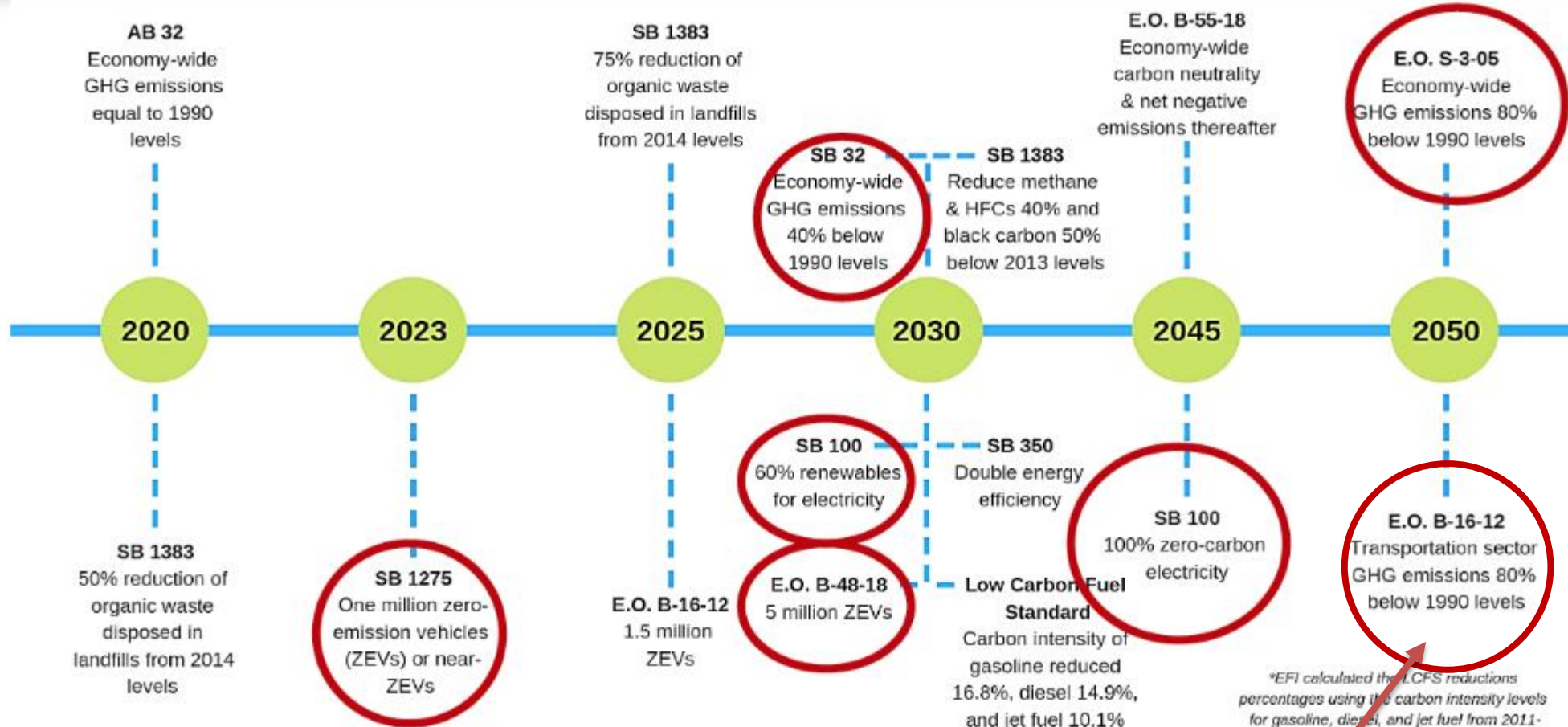
Timeline of Key California Policies for GHG Reductions



*EFI calculated the LCFS reductions percentages using the carbon intensity levels for gasoline, diesel, and jet fuel from 2011-17 CCR § 95480-95497

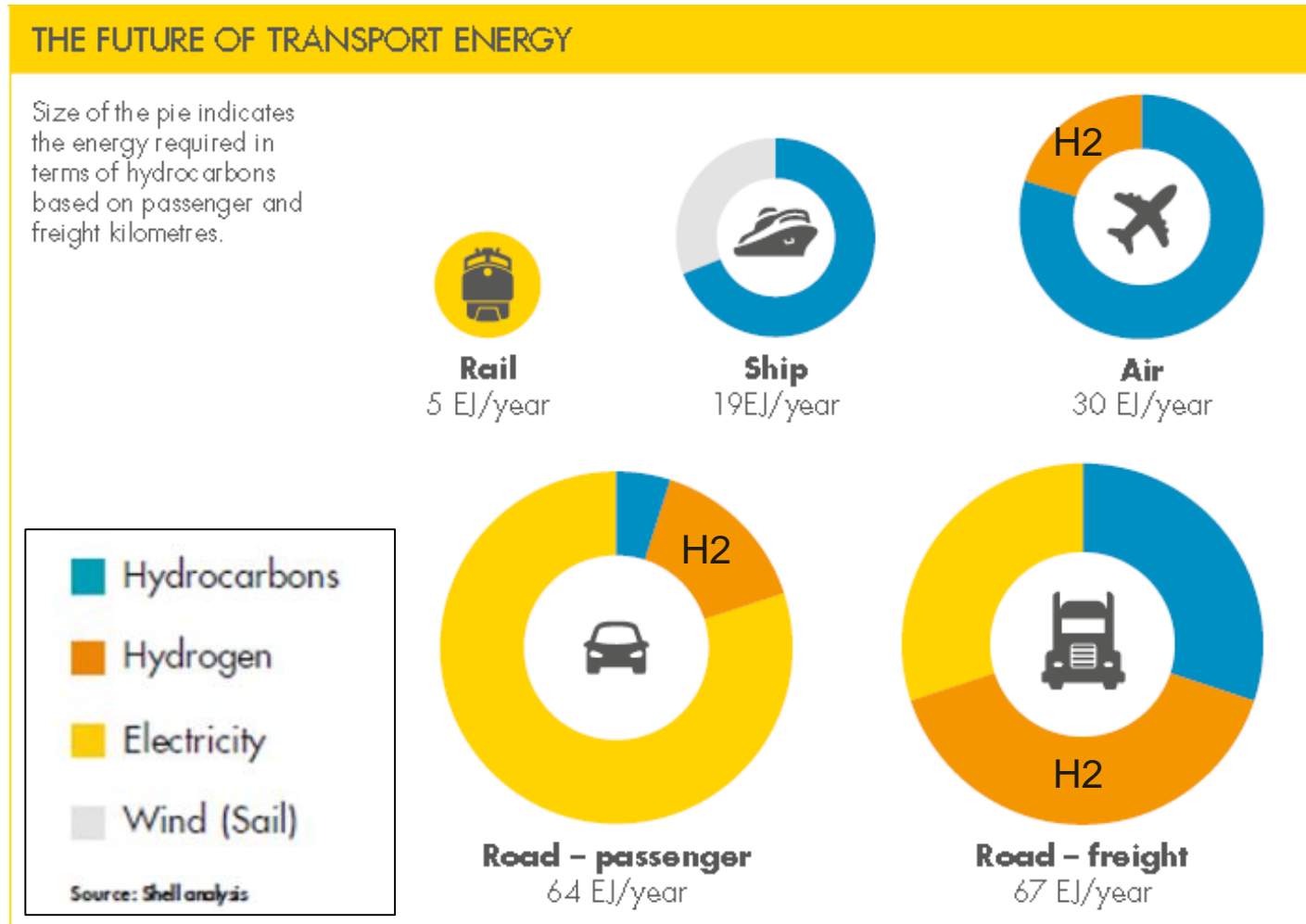
Five million ZEVs Will Requires Doubling CA Electrical Energy Supply

Timeline of Key California Policies for GHG Reductions

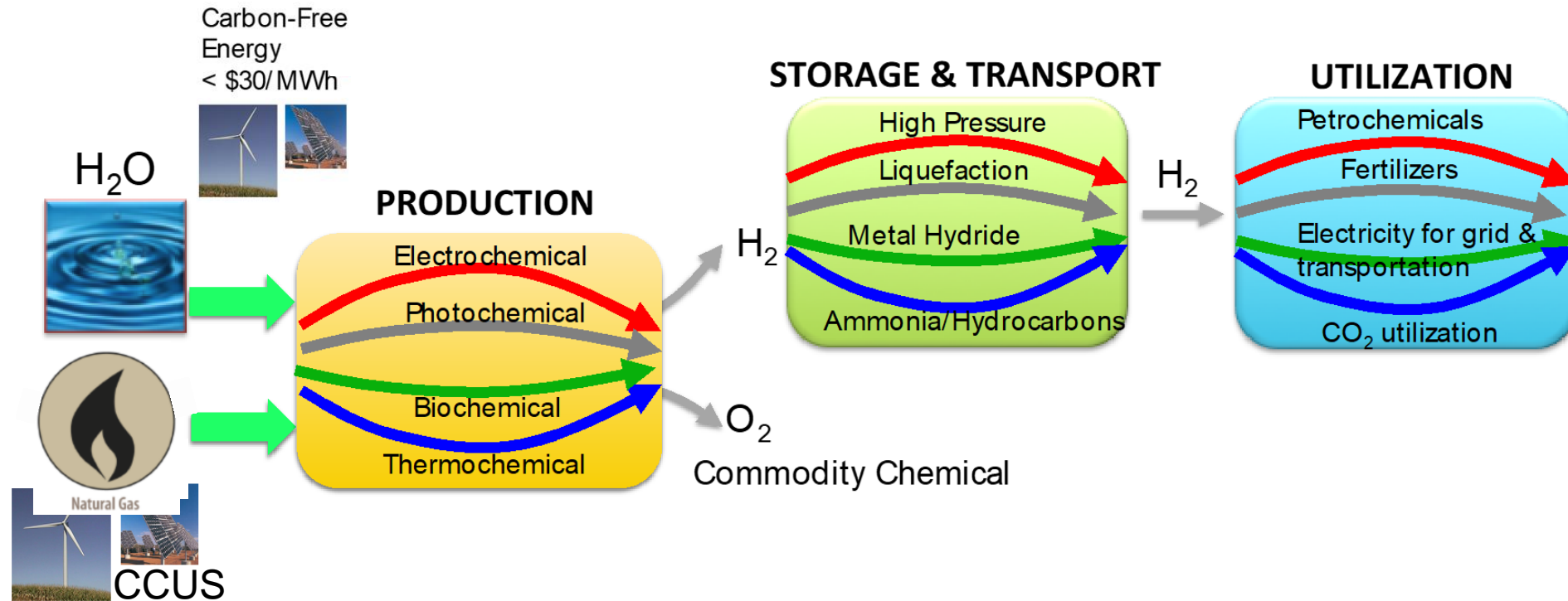


Fifteen million ZEVs Will Requires Quadrupling CA Electrical Energy Supply – Hydrogen for HDV's?

Significant Global H2 Demand to Achieve Net Zero Emissions



Natural Gas and the H₂ Economy

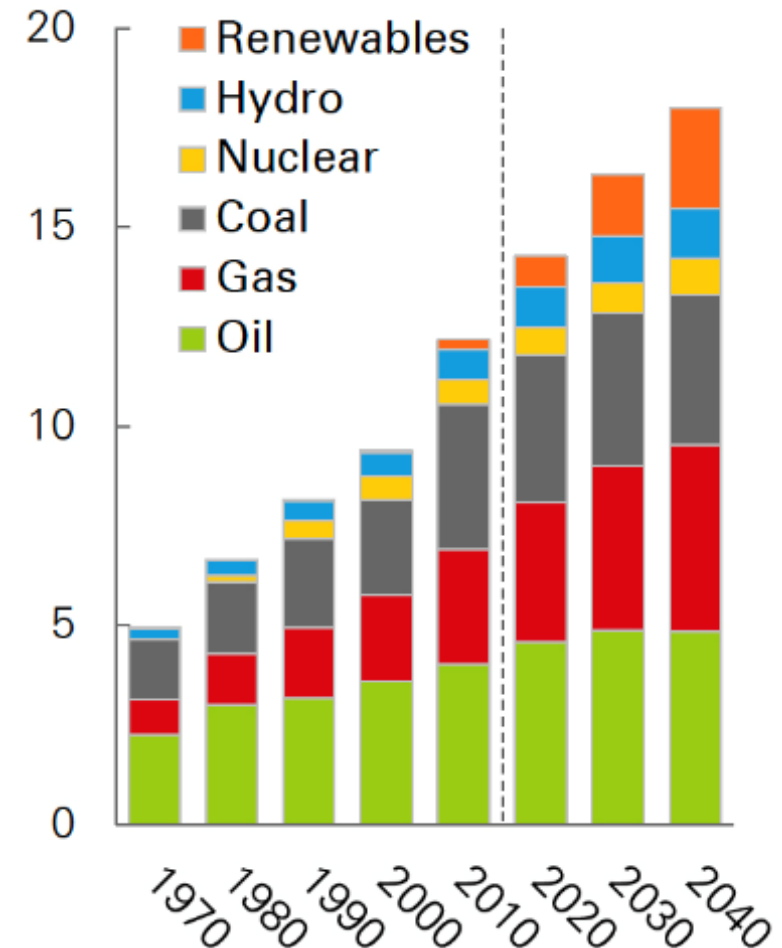


Oil and Gas in the Era of Decarbonization

- The Unconventional Revolution, and the “New Global Abundance” of Natural Gas, Provide Immediate Opportunities for Decarbonization of the Electrical Power Sector Through Fuel Switching in Many Countries Around the World
- Natural Gas and Natural Gas Liquids Are Needed to Provide a Thermal Fuel for the Developing World
- Natural Gas Will Continue to be a Critical Component of Energy Systems in Rapidly Decarbonizing Economies (Such as California) for Decades to Come
- **The Oil and Gas Industry Must Play a Major Role in Achieving the CO₂ Emission Reductions Needed to Meet the Objectives of the Paris Accords**

Energy (and GHG Emissions) in 2040

- Oil and coal remain approximately constant, new energy from natural gas and renewables
- Similar Estimates from Other Major Oil Companies; U.S. Dept. of Energy (EIA); and International Energy Agency (IEA)
- Between now and 2040, without CCS, CO₂ emissions will continue to increase (but at a slower rate)



2018 BP Energy Outlook



A catalyst for change

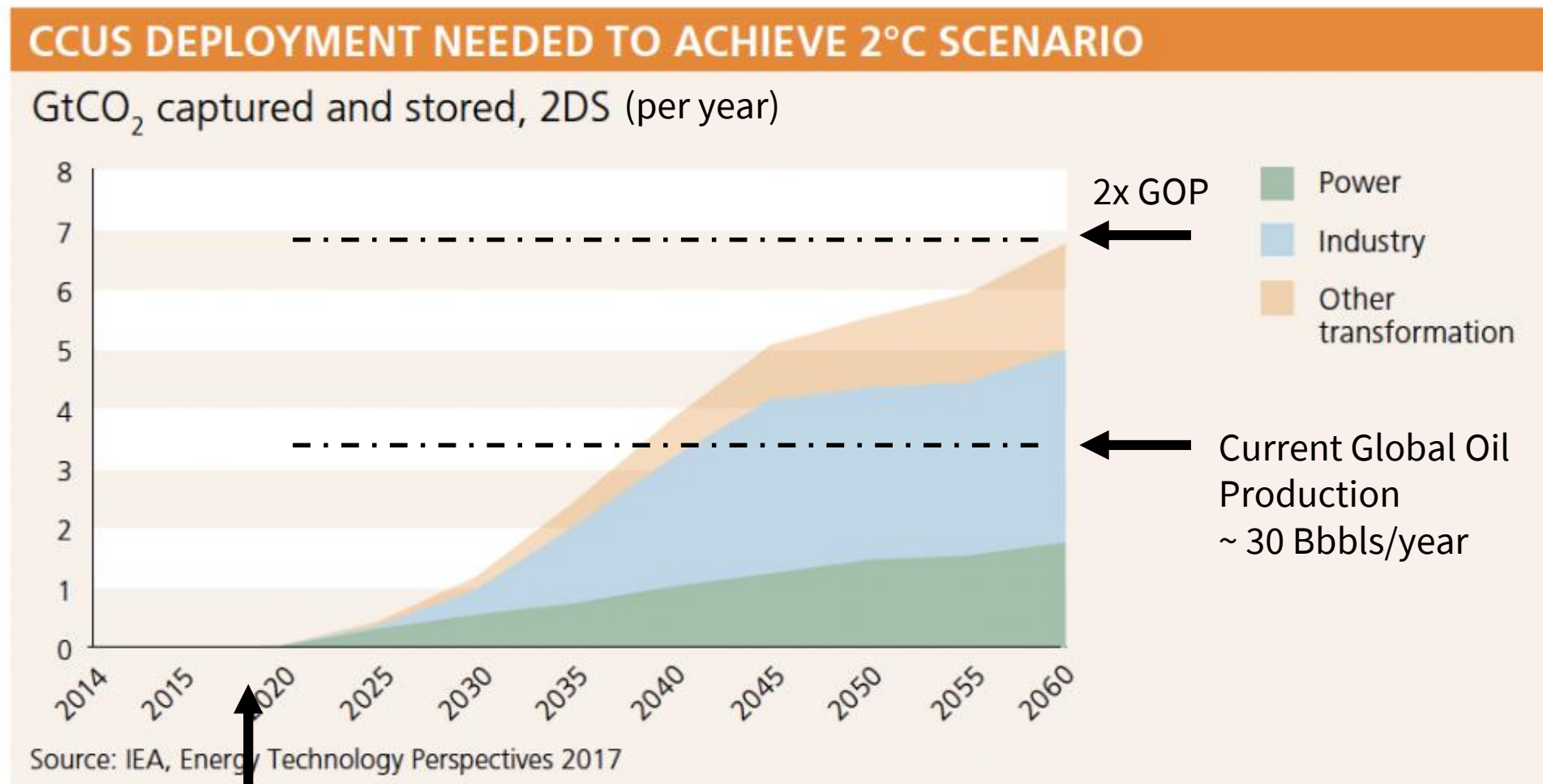
OGCI is a voluntary CEO-led initiative taking practical actions on climate change. OGCI members leverage our collective strength to lower carbon footprints of energy, industry, transportation value chains via engagements, policies, investments and deployment.



ExxonMobil

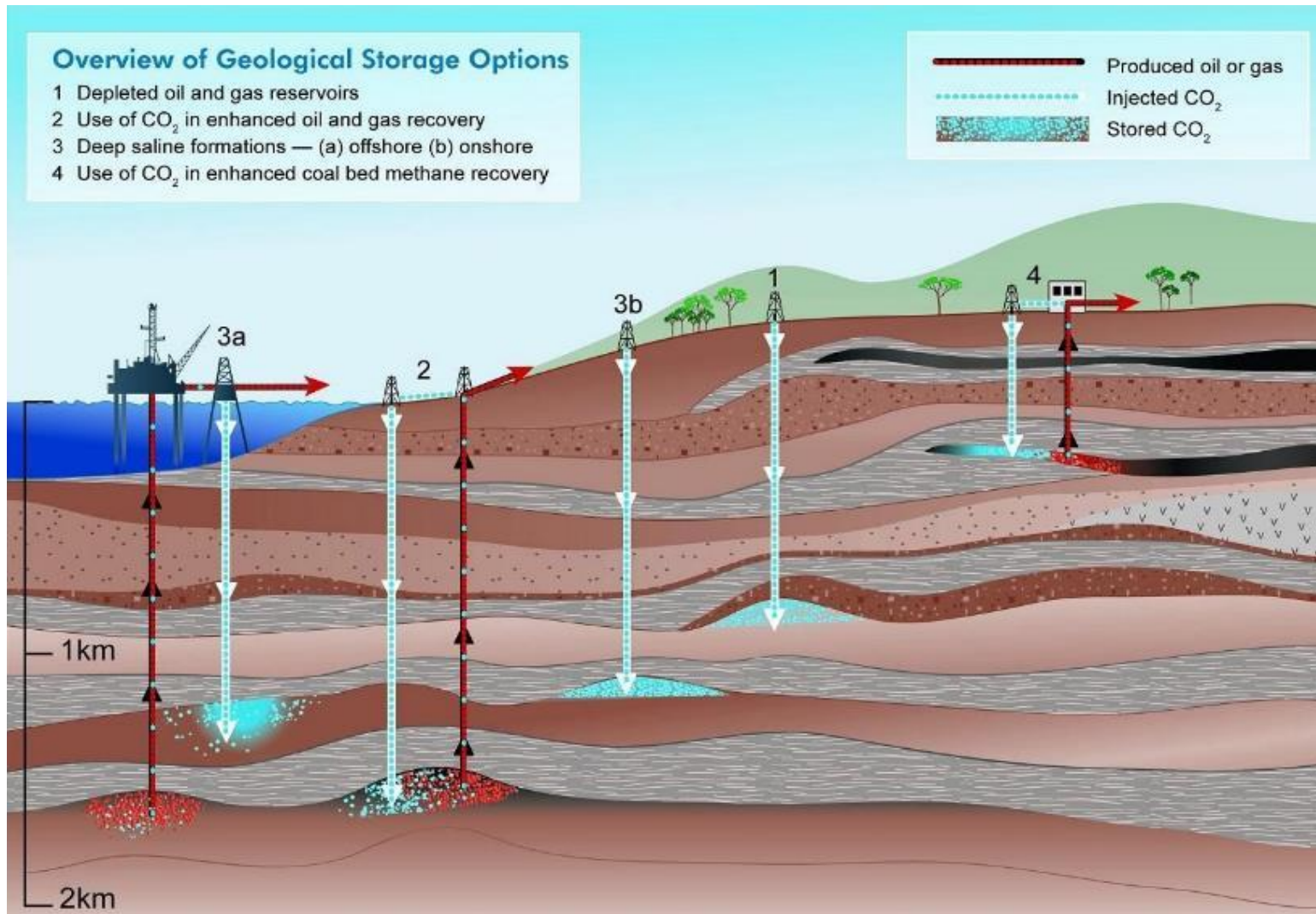


Carbon Capture and Storage Requirements



Current CCS - ~30 Mt CO₂/year

Many Options for Geologic Storage of CO₂

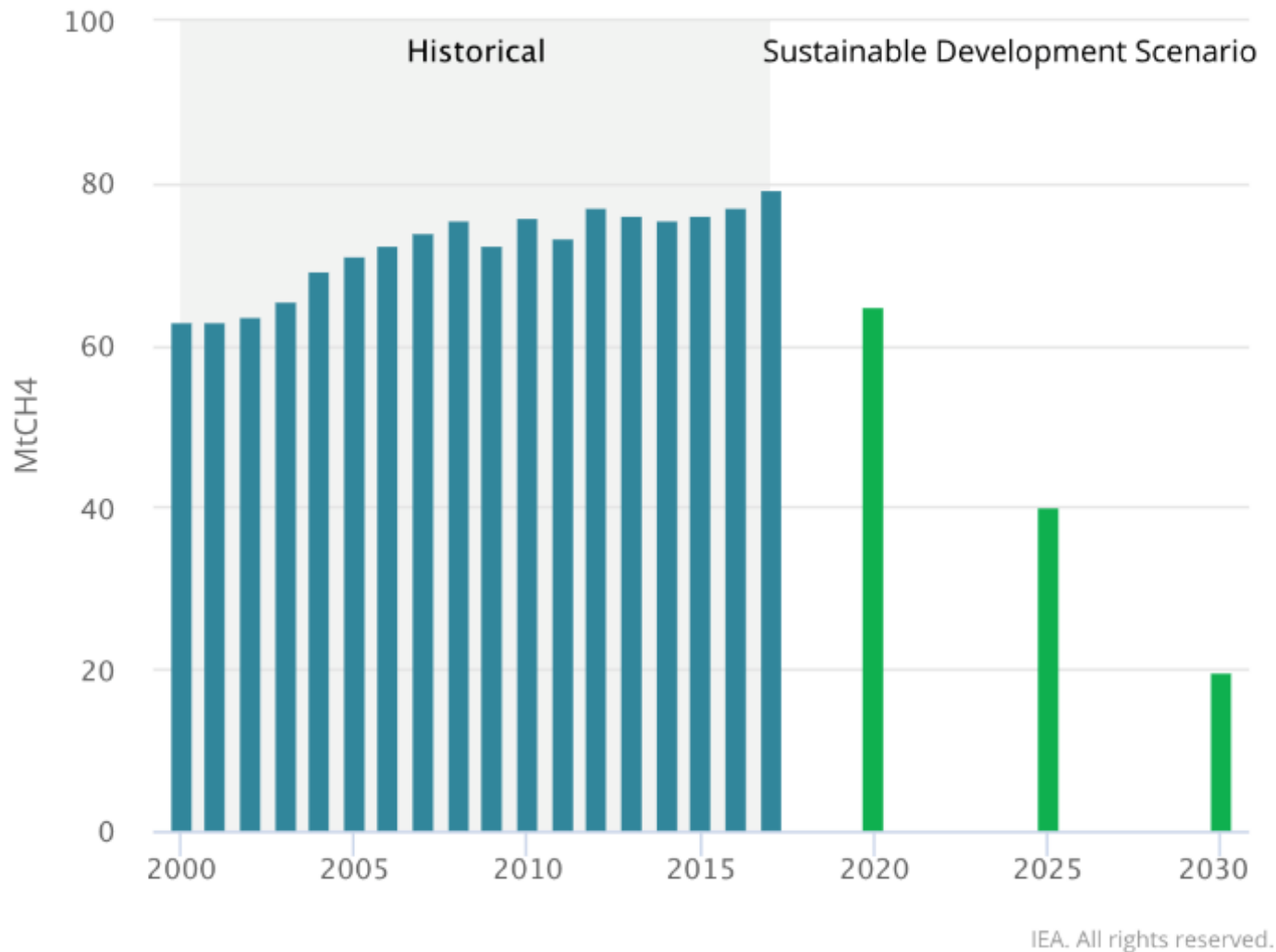


IPCC (2005)

45Q – Tax Credits

- US Federal Tax credit available since 2008 linked to the installation and use of carbon capture equipment that directly removes CO₂ from the atmosphere
- The “Bipartisan Budget Act of 2018” Increased the credit amount:
 - From \$20/ton to \$50/ton for geologic storage
 - From \$10/ton to \$35/ton for EOR or if used in products
- Qualified facilities must begin construction by January 1, 2024
- Credit is available for 12 years after start up
- Treasury working to finalize guidance for project developers
- ~60 million metric tons claimed as of May 2018, but only ~6 million of those tons were sequestered using approved regulations to demonstrate secure storage (~\$2B)

Global Methane Emissions from Oil and Gas Operations



- Methane emissions from the oil and gas sector account for 6% of global energy sector GHG emissions.
- Further innovation is needed both to increase understanding of emissions levels and to help reduce the cost of emissions mitigation strategies such as leak detection and repair.

Methane Emissions Research

Quantifying the Scale and Impact:

A.R. Brandt, et al., Science, 2014

- Official inventories consistently underestimate actual CH₄ emissions
- A small number of “super-emitters” are responsible for a large fraction of leakage
- Assessments using 100-year impact indicators show system-wide leakage is unlikely to be large enough to negate climate benefits of coal-to-Natural Gas substitution.

Designing and Testing Mitigation and Detection Technologies:

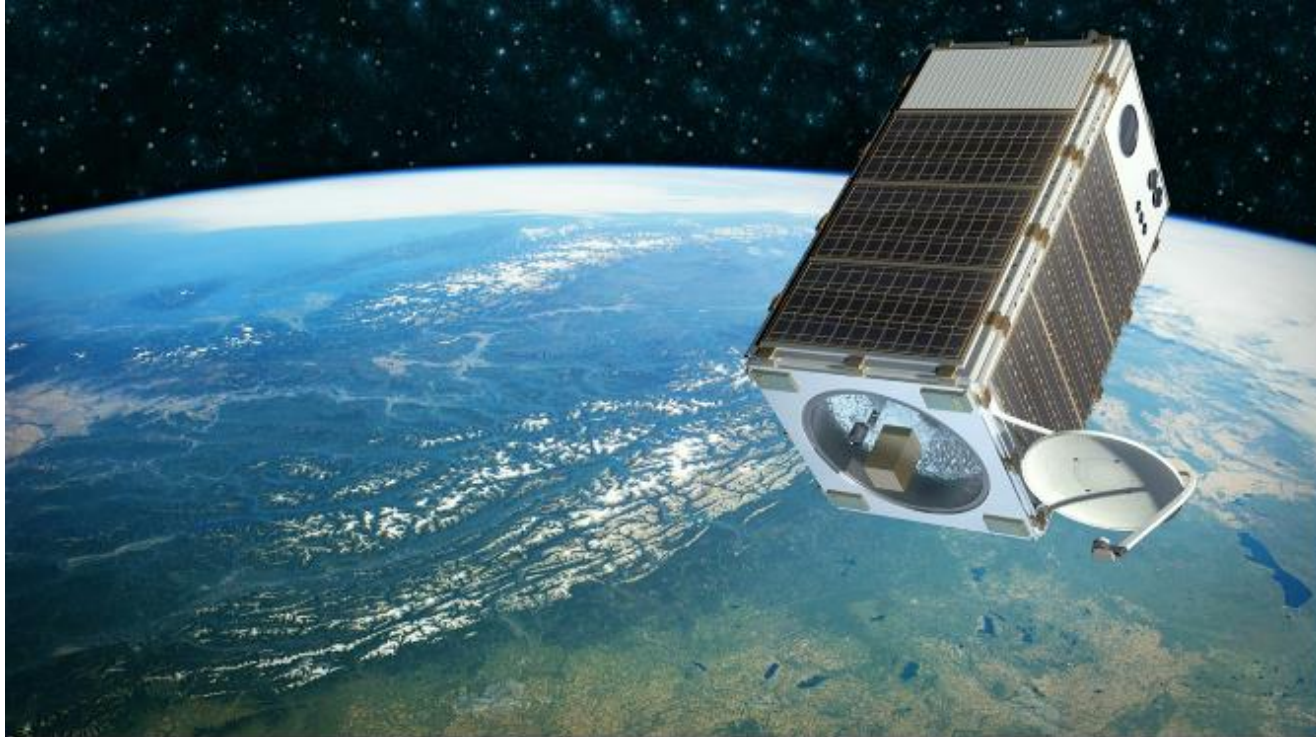
Ravikumar, et al., Elem Sci Anth, 2019



A drone sniffs for methane leaks in the Mobile Monitoring Challenge at the test site in Colorado.

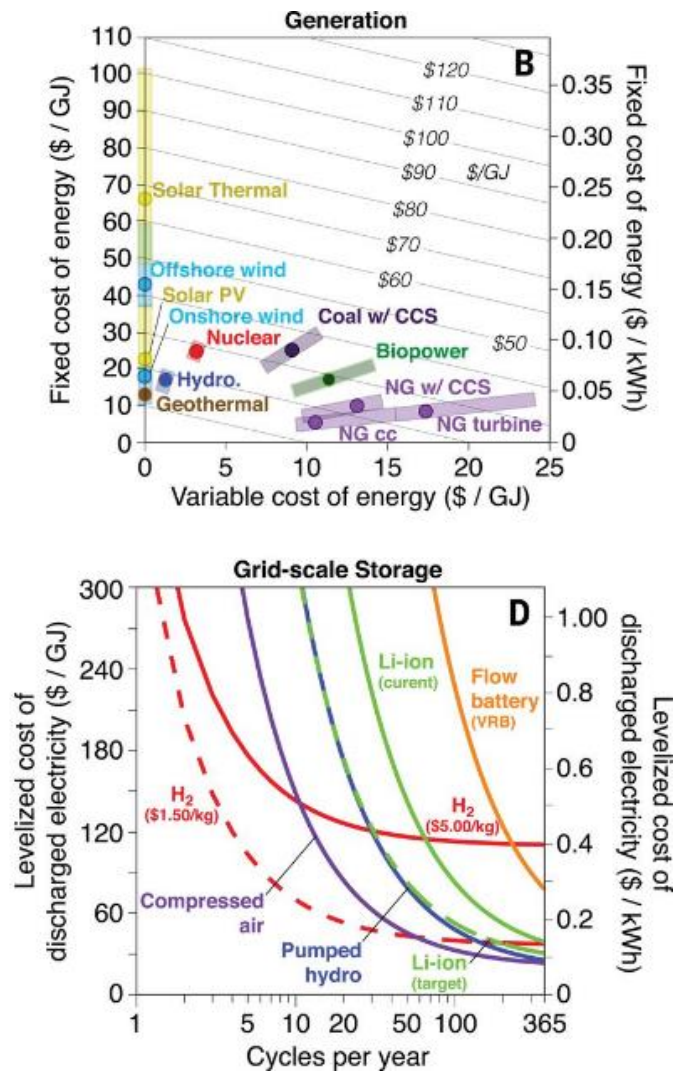
(Image credit: Sean Boggs/Environmental Defense Fund)

MethaneSAT



- Environmental Defense Fund project with the goal of cutting methane emissions 45 percent by 2025
- Utilizes spectrometer technology currently deployed on aircraft to measure the absorption of reflected sunlight by methane molecules
- Detection capabilities suitable for flaring and large leaks
- Launch planned for 2022

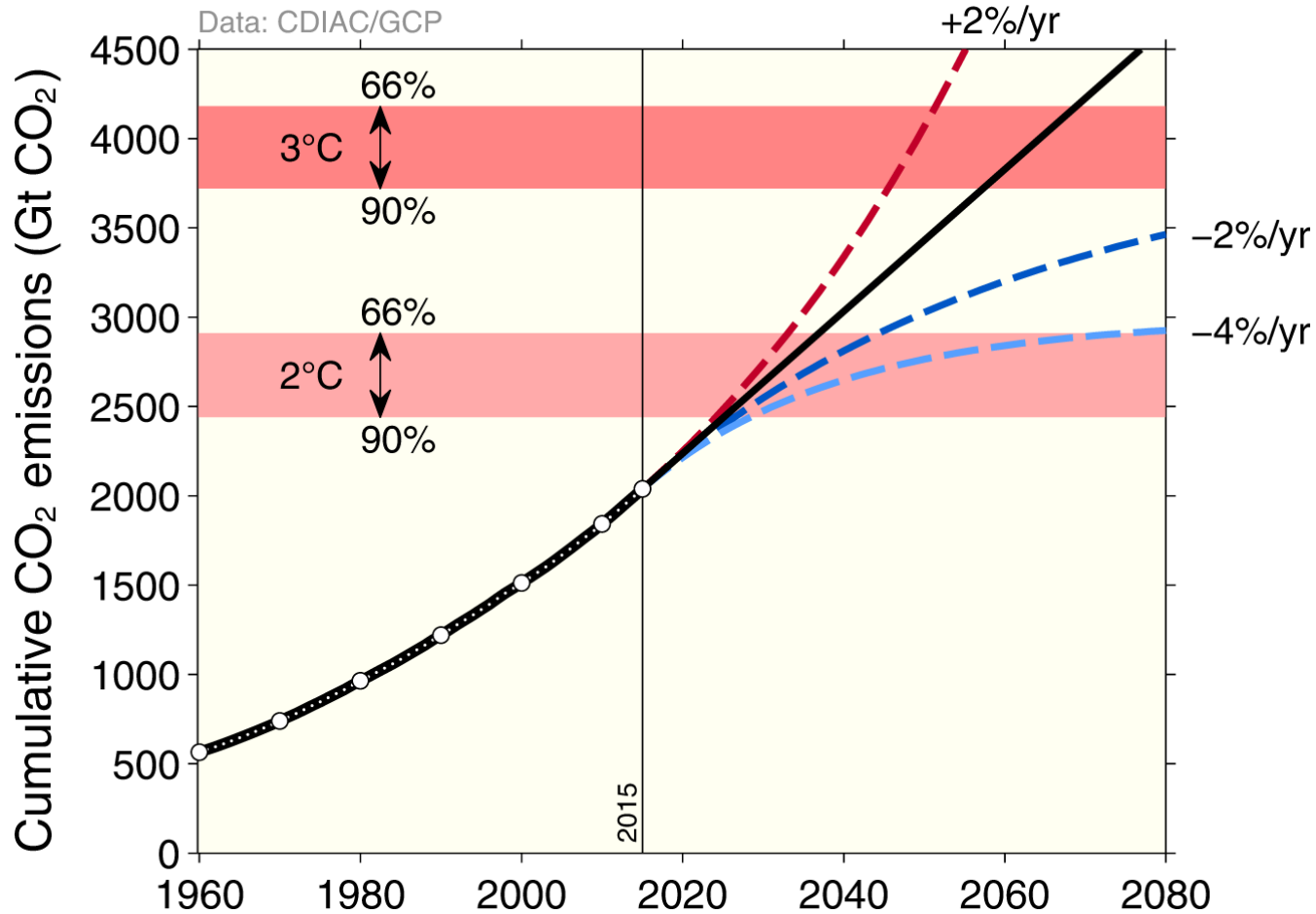
Natural Gas as a Reliable Energy Backup for Renewables



- Modern economies demand highly reliable and affordable electricity
- This requires energy generation or storage assets that will be used a small percentage of the time, when demand is high relative to baseload generation
- Natural gas-fired generators have increasingly been used to provide a reliable backup for renewables because of their relatively low fixed costs, their ability to ramp up and down quickly, and the affordability of natural gas

S. J. Davis, et al., Science, 2018

The Oil & Gas Industry of the Future



Meeting Global Climate Goals
(Limiting Global Warming to 2° C)
Will Require The Oil and Gas
Industry to be in the Business of
Producing Oil and Gas and
Sequestering Enormous
Quantities of CO₂ in Depleted Oil
and Gas Reservoirs

Acknowledgements

Mark Zoback **Director, Stanford Natural Gas Initiative**
Co-Director, Stanford Carbon Management Initiative
Benjamin M. Page Professor of Geophysics

Scott Anderson, *Environmental Defense Fund*

Bob Balch, *New Mexico Tech, Petroleum Recovery Research Center*

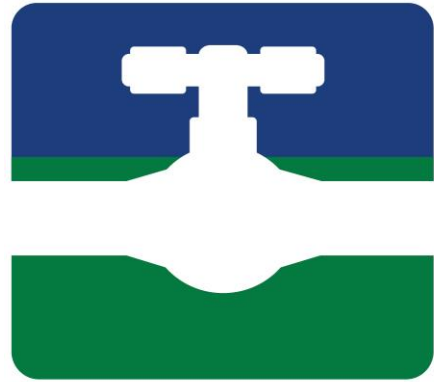
Steve Carpenter, *University of Wyoming, Enhanced Oil Recovery Institute*

Tony Kavscek, *Stanford Dept. of Energy Resource Engineering*

Sarah Saltzer, *Stanford Center for Carbon Storage*



Thank you



INGAA

FOUNDATION

30 YEARS OF EXCELLENCE

ANNOUNCEMENTS

Tony Straquadine

Executive Director

The INGAA Foundation



AFTERNOON OPTIONAL ACTIVITIES

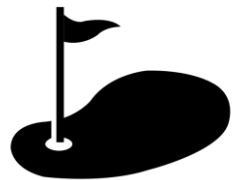
Newport Harbor & Duffy Boat Sightseeing Tour

Meet in the Lobby, Bus departs promptly at noon

Golf Tournament

Monarch Beach Golf Links Golf Course

Shotgun Start at 12:30 pm



Created by Nick Holroyd
from Noun Project



EVENING ACTIVITIES



Reception



Pacific Lawn | 6:30 pm

30th Anniversary INGAA Foundation Dinner

Pacific Ballroom | 7:30 pm



The INGAA
Foundation, Inc.
30 YEARS OF EXCELLENCE

