

Energy Technologies Area

Lawrence Berkeley National Laboratory

# NEW ERA, NEW SOLUTIONS FOR GREEN PROSPERITY

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# REINVENTING FIRE: CHINA

A ROADMAP FOR CHINA'S REVOLUTION  
IN ENERGY CONSUMPTION AND  
PRODUCTION TO 2050

## 重塑能源：中国

面向2050年能源消费和生产革命路线图研究



# RF: CHINA – KEY FINDINGS

## 6× GDP

Chinese economy increases 6 times by 2050

## +1% Primary Energy

Using about the same amount of energy as today

## -42% CO<sub>2</sub> emission

## -90% Air Pollution

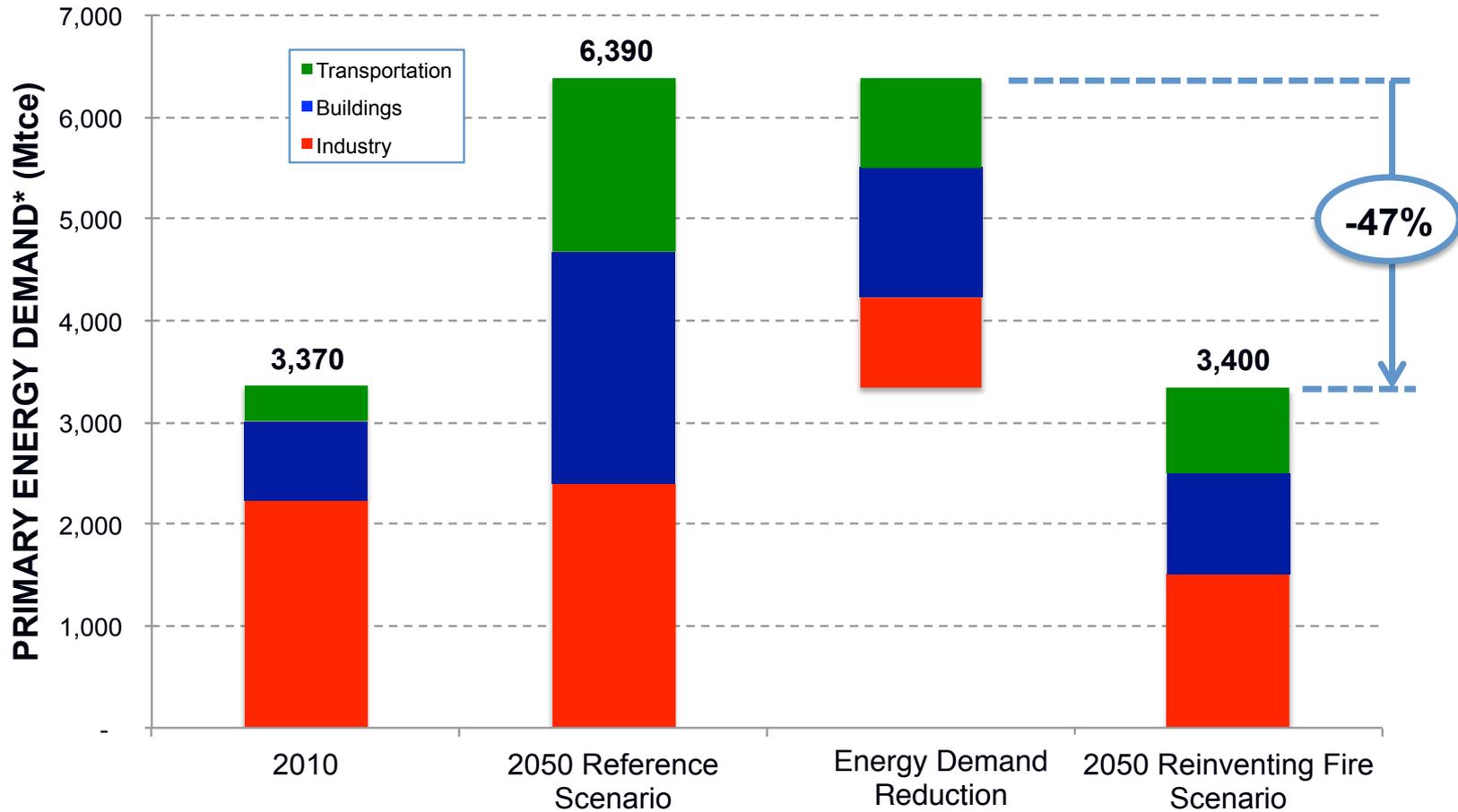
SO<sub>2</sub> and NO<sub>x</sub>

## 21 RMB Trillion net benefit

Requires 35 RMB Trillion investment for 56 RMB Trillion benefit, excluding environmental gains

100%  
Technically  
feasible, cost-  
effective and  
socially  
acceptable

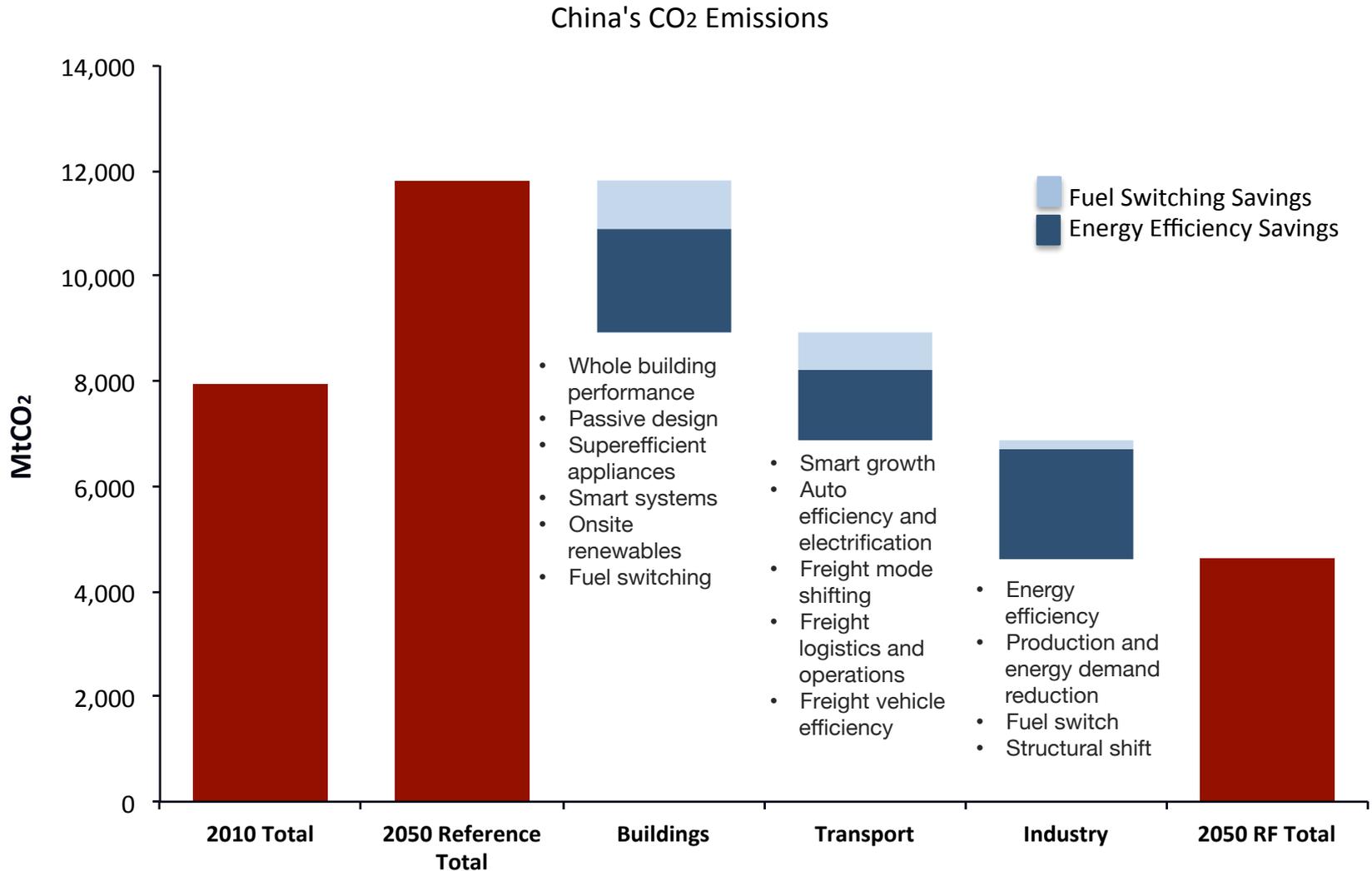
# DECOUPLING ENERGY DEMAND THROUGH IMPROVED EFFICIENCY



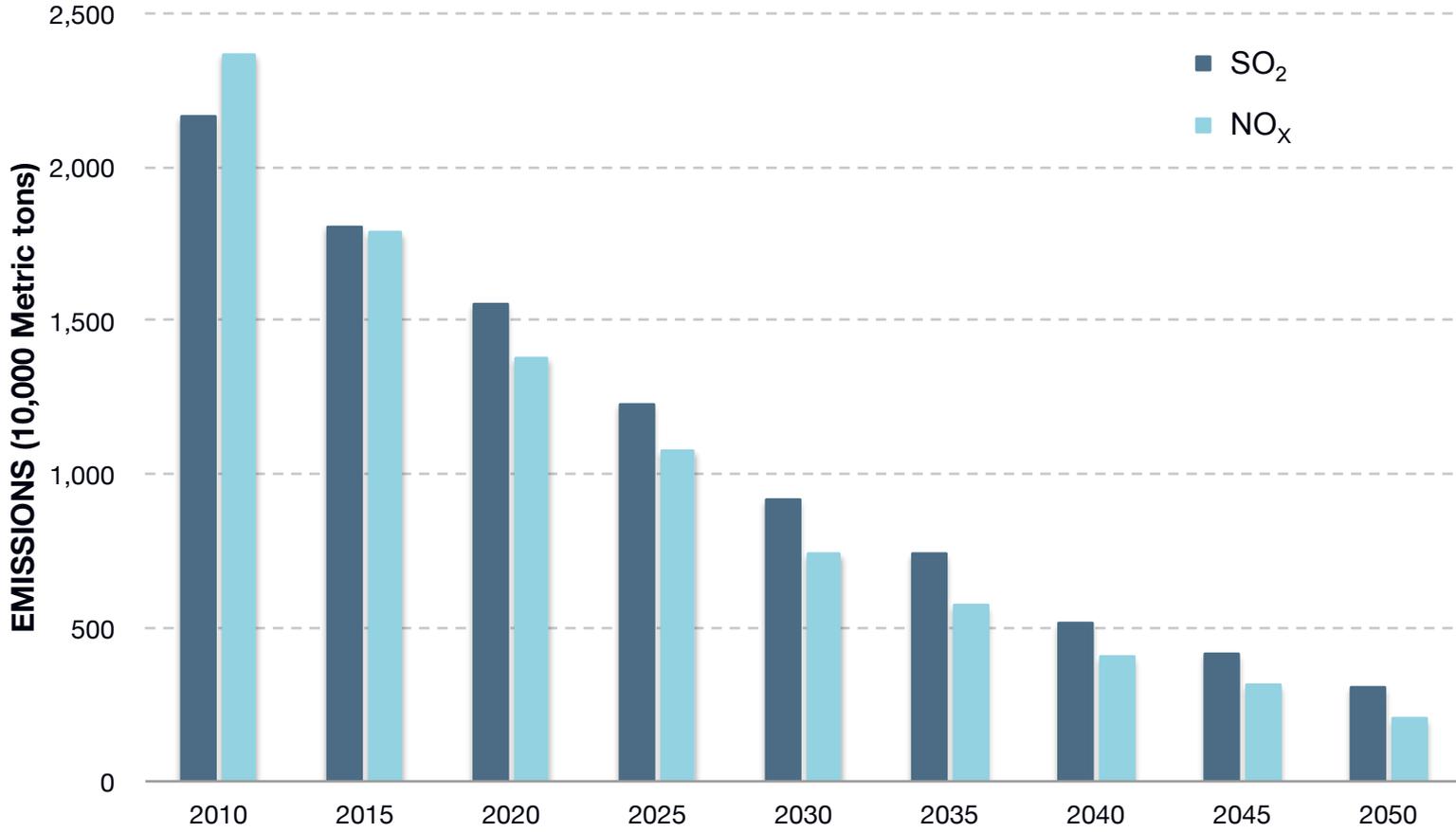
\* Primary electricity converted using the direct equivalent method (consistent with IPCC).

Source: Reinventing Fire: China team analysis

# RF: CHINA CO<sub>2</sub> EMISSIONS REDUCTIONS, 42% LOWER

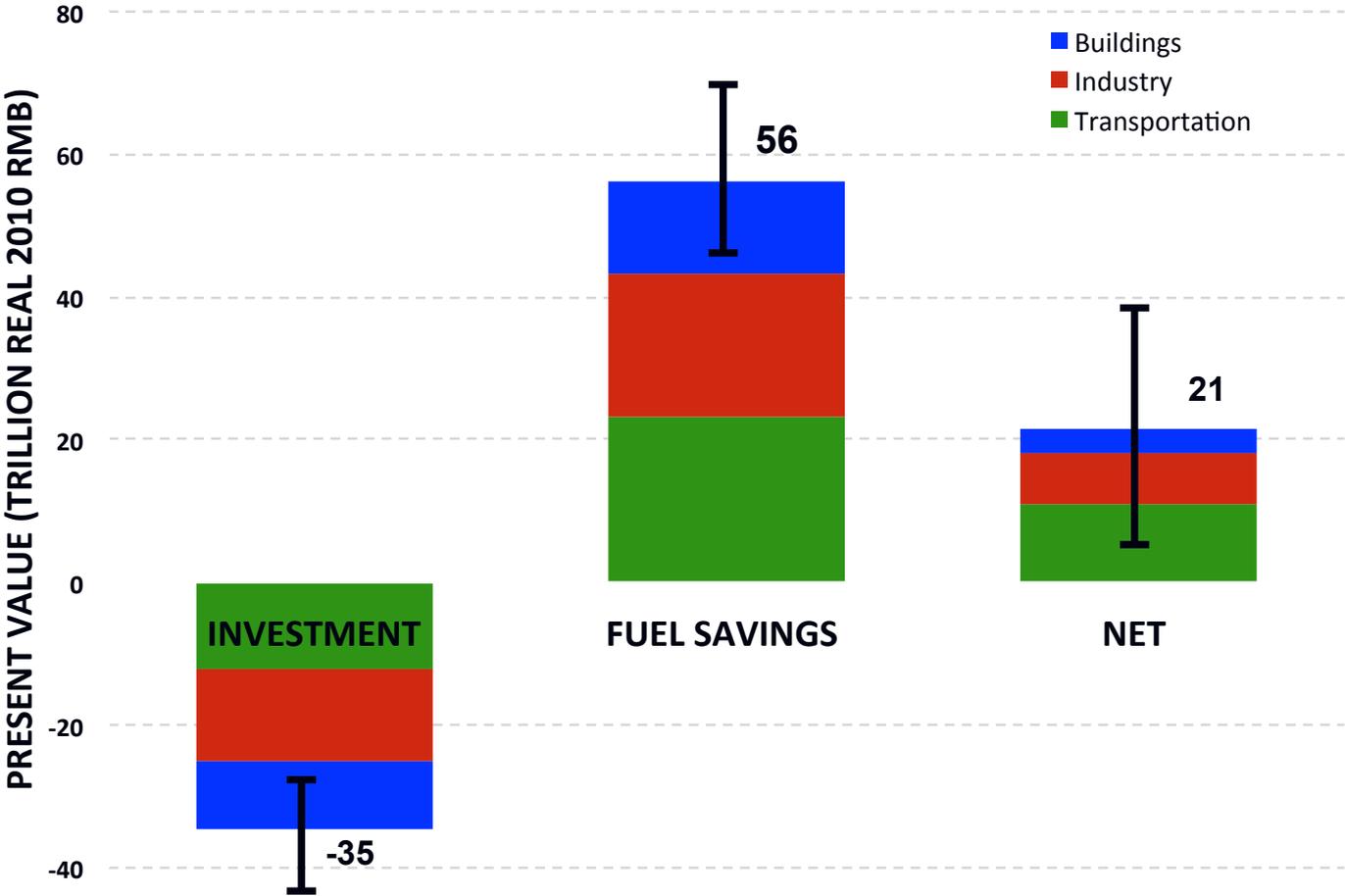


# ADDITIONAL REDUCTIONS IN ENERGY-RELATED AIR POLLUTION



Source: Energy Research Institute emissions calculations; Reinventing Fire: China team analysis.

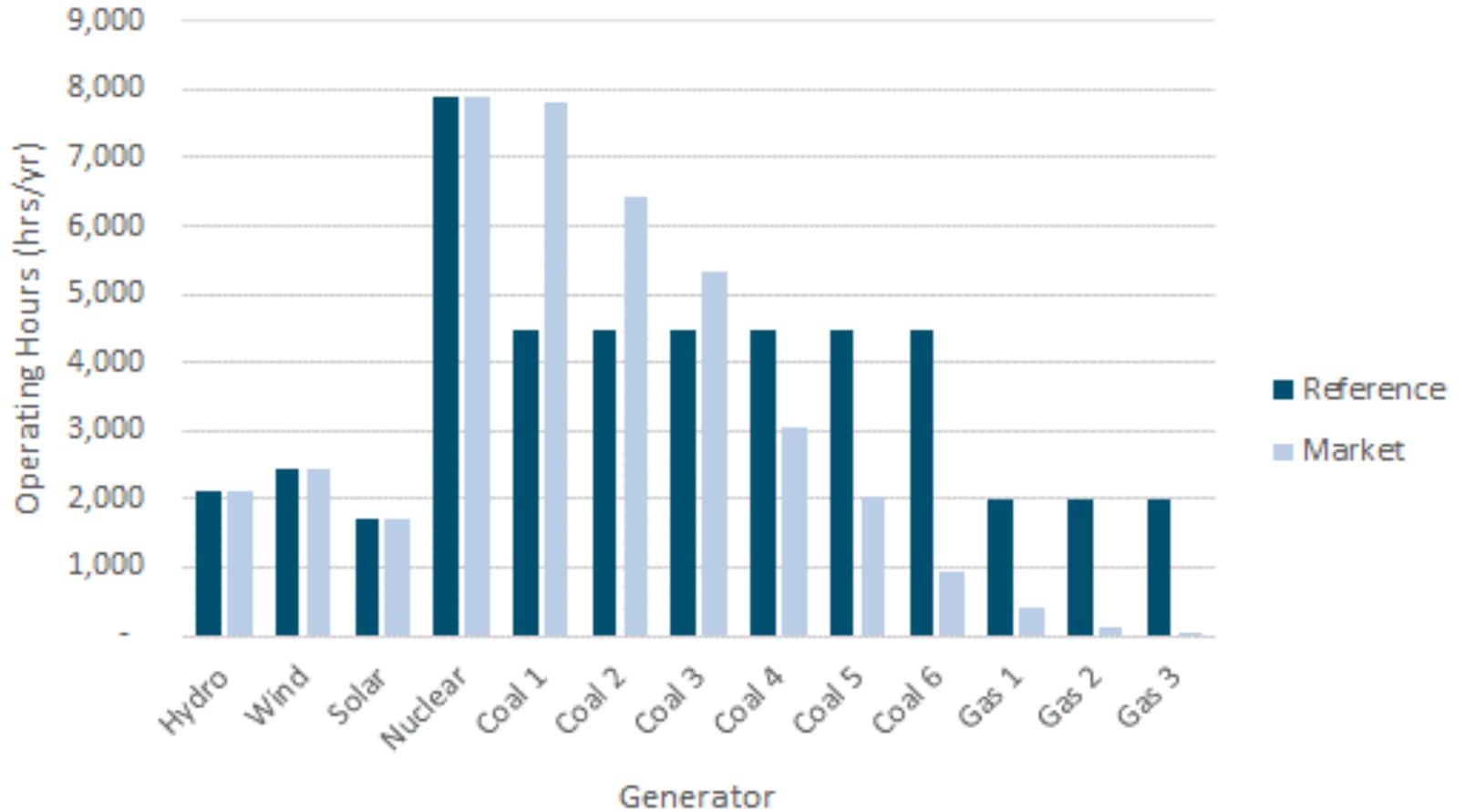
# ACCOMPLISHED USING AVAILABLE, COST-EFFECTIVE SOLUTIONS



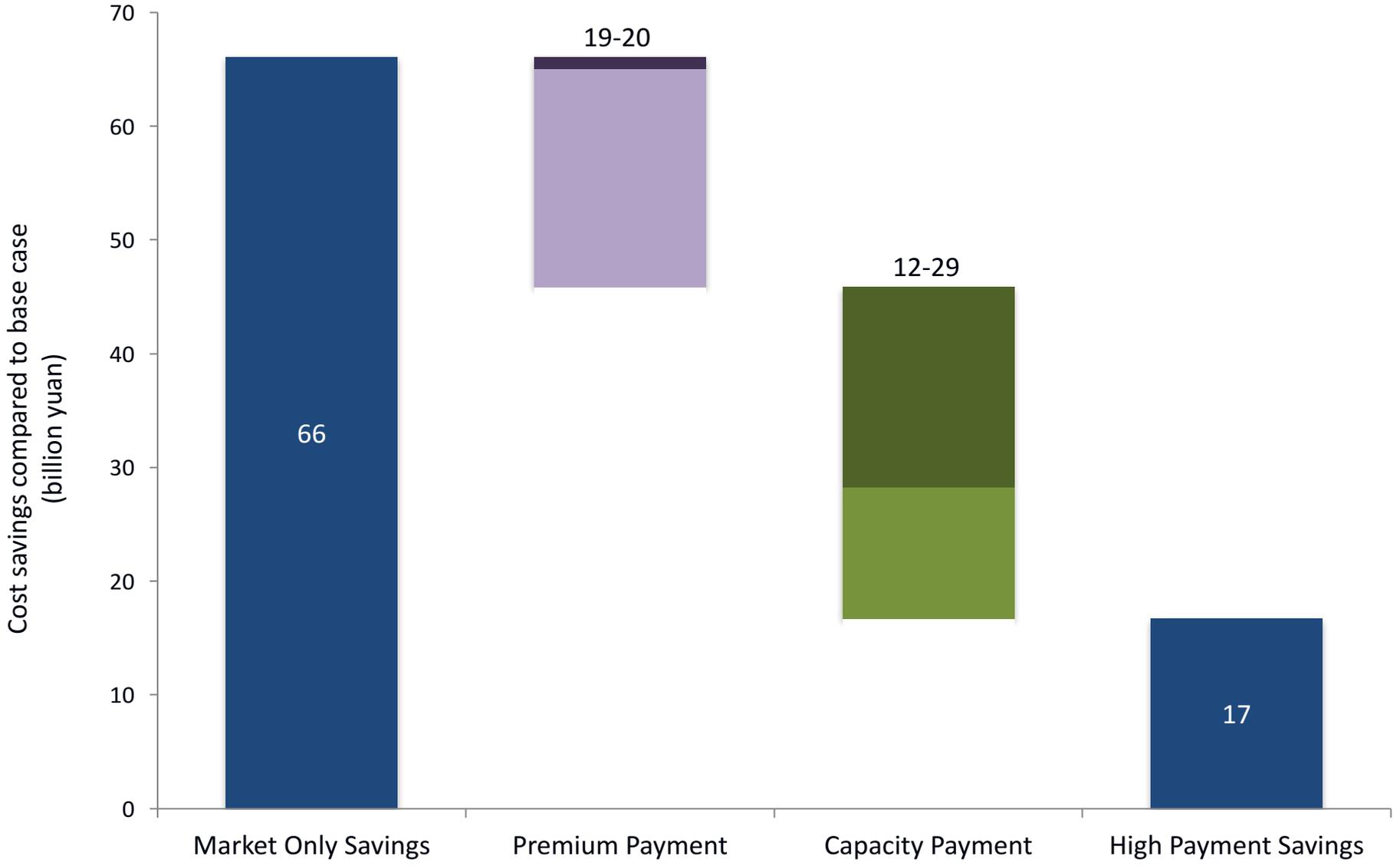
Source: Reinventing Fire: China team analysis.

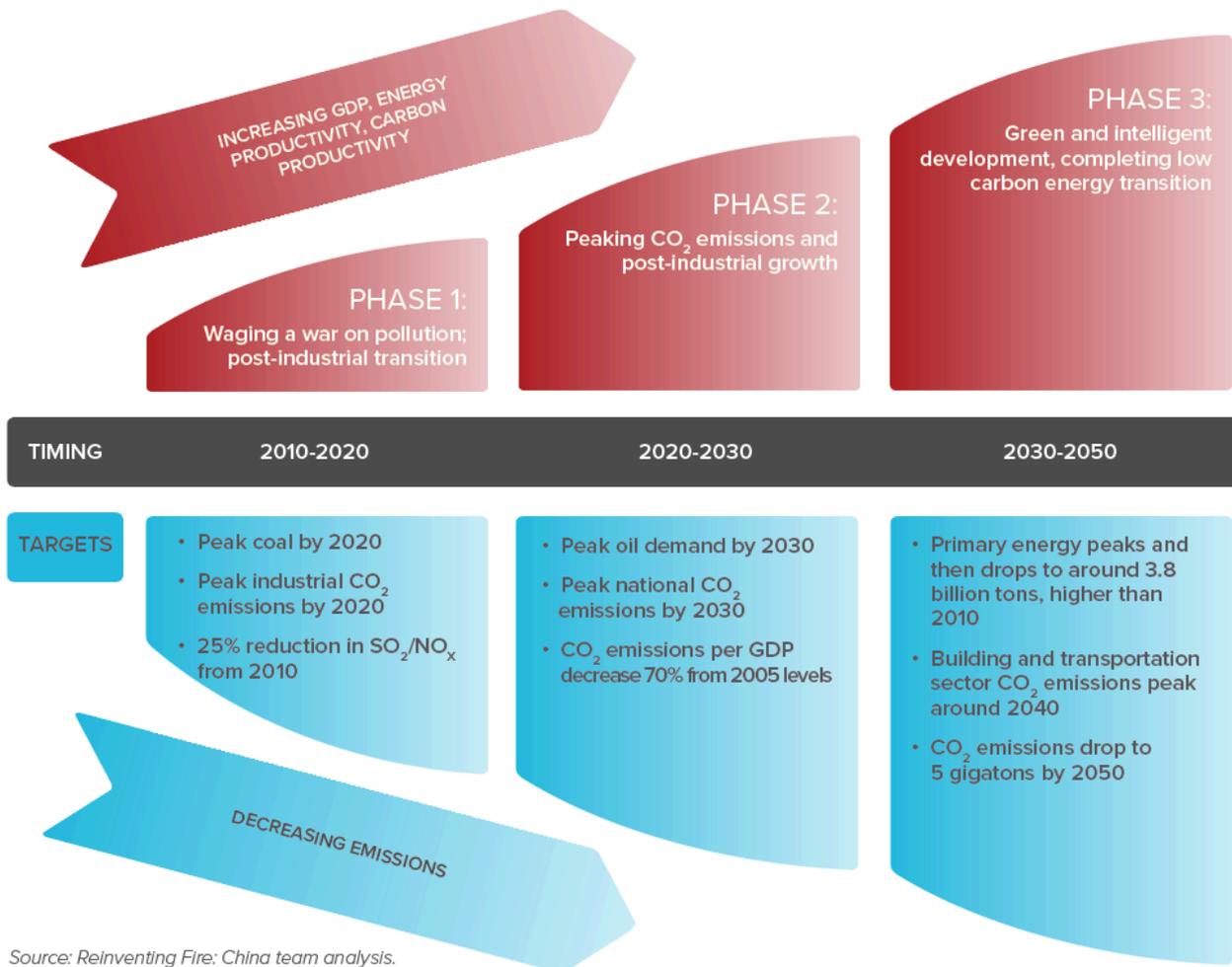
# IMPACT OF MARKET TRANSITION ON DIFFERENT TYPE OF GENERATORS

Annual Operating Hours in the Reference and Market Cases, by Generator Type



# TRANSITION TOWARDS MARKET YIELD LARGE COST SAVINGS (7-28%) FOR THE SOCIETY, BUT SAVINGS SHRINKS WITH ADDITIONAL PAYMENTS





Source: Reinventing Fire: China team analysis.