

# COST-EFFECTIVE AIR QUALITY MANAGEMENT MEASURES IN KAZAKHSTAN AND THEIR IMPACT ON GHG EMISSIONS

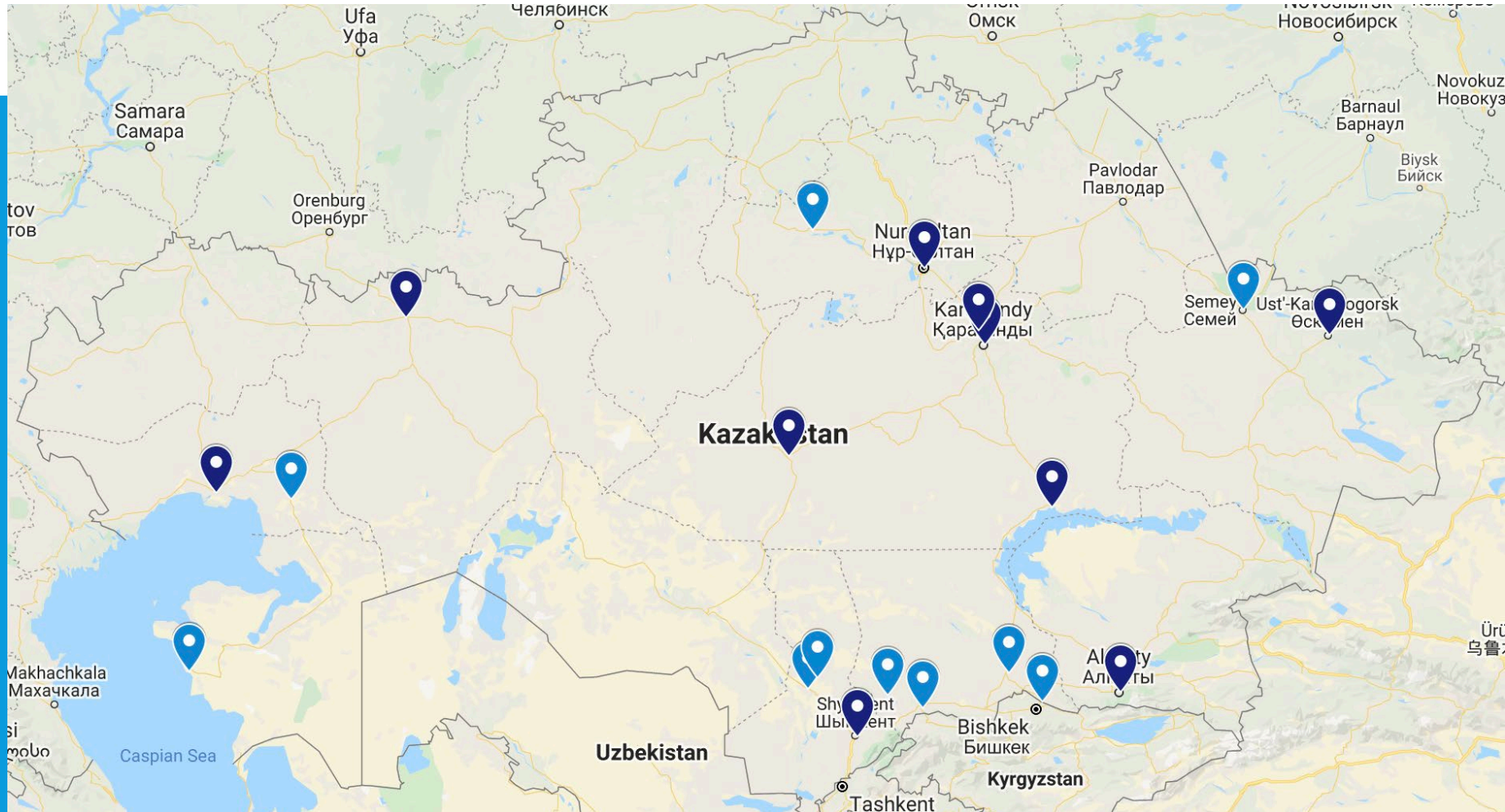
AN INTEGRATION STUDY CONDUCTED BY THE WORLD BANK

MARKUS AMANN, JULY 12, 2021



**WORLD BANK GROUP**

# THE STUDY - AIR POLLUTION IN KAZAKHSTAN



High air pollution



Increased air pollution

Classification is according to Informational Bulletin “On the state of the environment in the Republic of Kazakhstan for 2019”

# DATA USED

- Air quality data for 10 cities from the national air quality network (provided by MEGNR)
- Energy data and energy balances (Bureau of National Statistics)
- Electricity data (KOREM)
- Transport data (Bureau of National Statistics)
- Residential heating survey data (Bureau of National Statistics)
- Industrial emissions (Bureau of National Statistics)
- Emissions data (Kazakhstan's under CLRTAP and UNFCCC)

Macroeconomic, population,  
energy data and forecasts

Emission co-control options for  
air pollutants and GHG

Emissions

Costs

Minimizes social costs  
of reducing population  
exposure to PM<sub>2.5</sub>

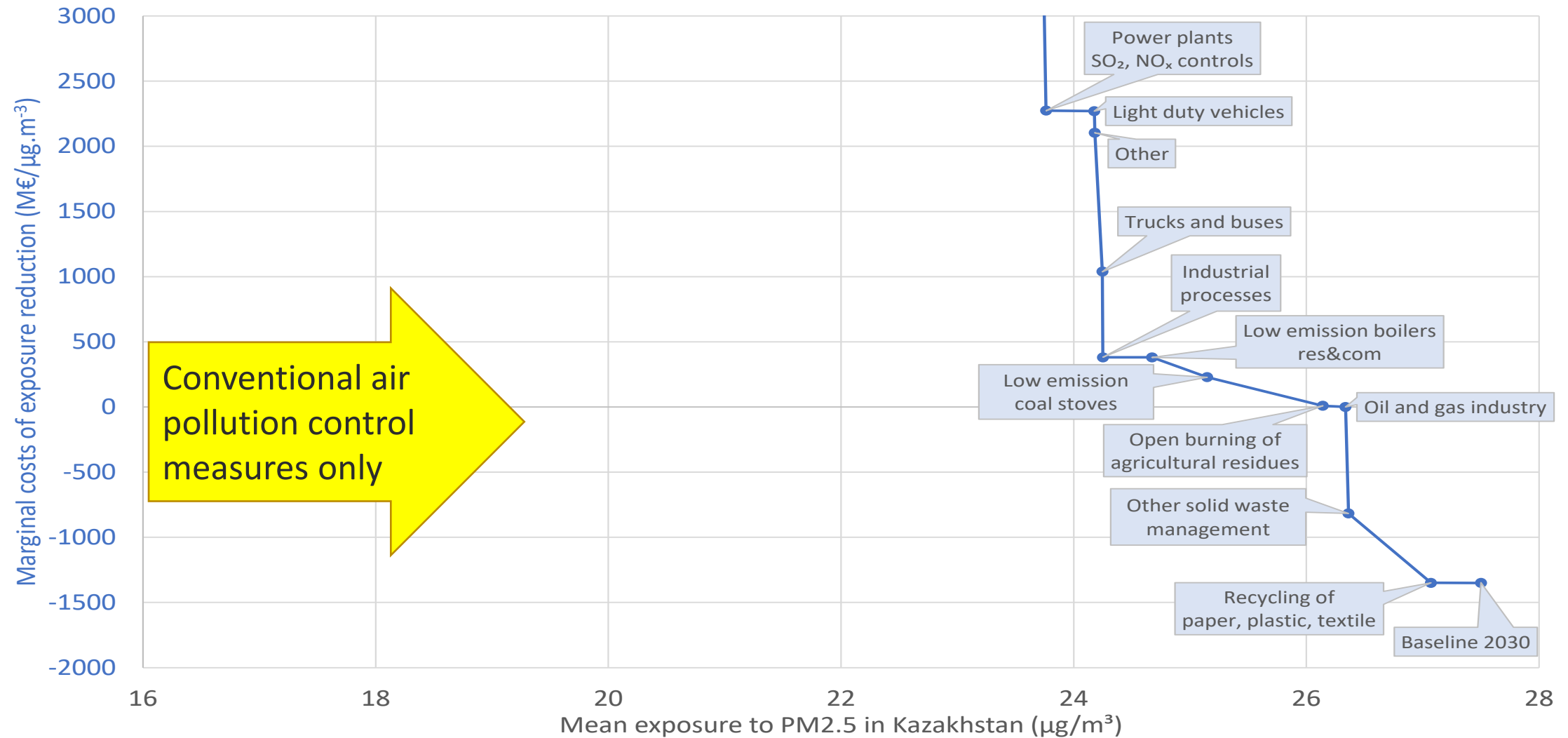
Atmospheric dispersion

Currently only for  
country-wide  
measures, not for  
individual cities

Health (population  
exposure) and climate  
impact

**GAINS MODELING AT THE  
NATIONAL LEVEL: IDENTIFIES  
COST-EFFECTIVE MEASURES TO  
REDUCE MEAN NATIONAL  
POPULATION EXPOSURE TO PM<sub>2.5</sub>**

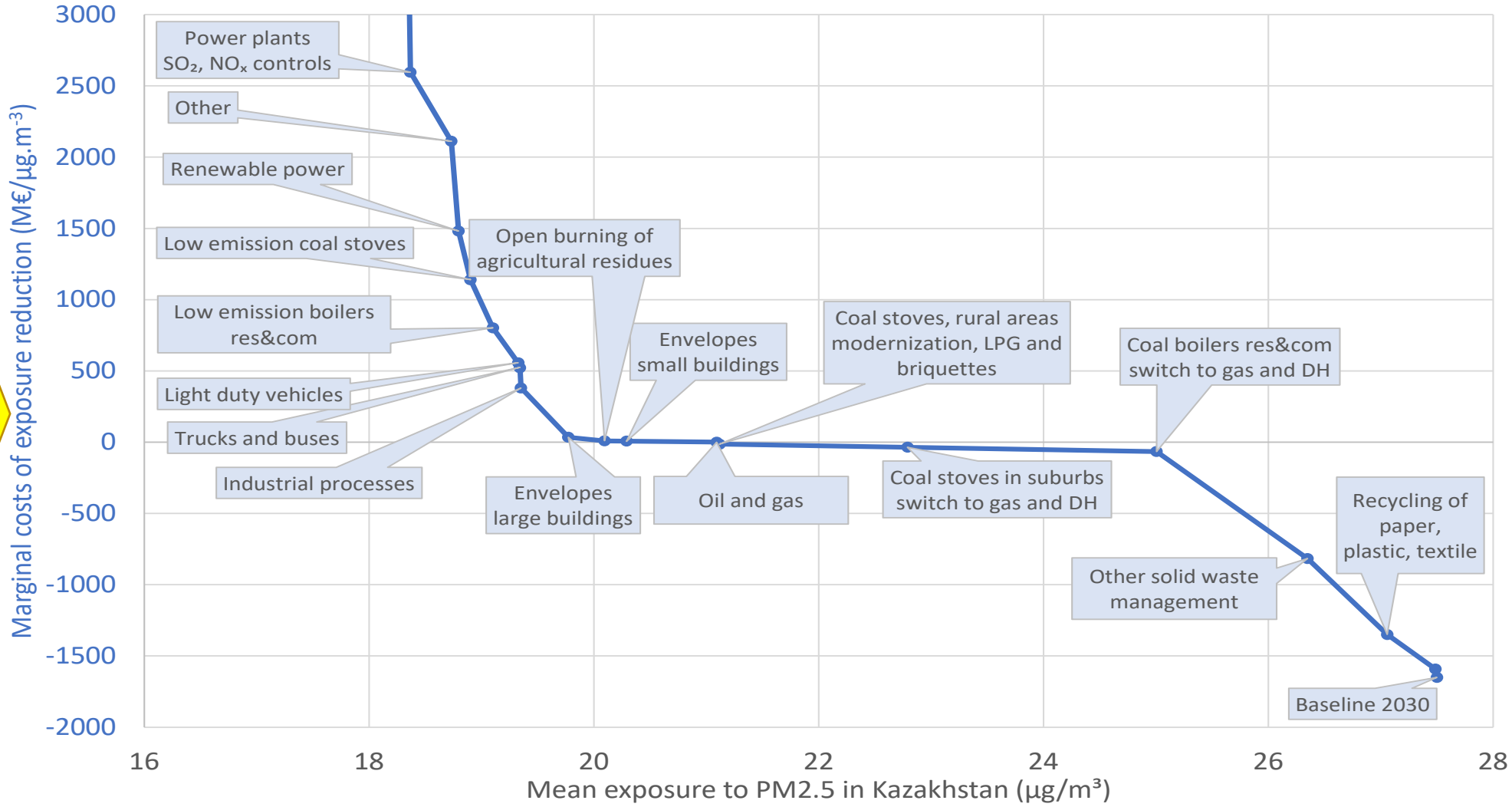
# GAINS MODELING RESULTS: HOUSEHOLD HEATING AND WASTE MANAGEMENT MEASURES ARE AMONG THE MOST COST-EFFECTIVE IN REDUCING PM<sub>2.5</sub> EXPOSURE



Marginal cost curve for population exposure to PM<sub>2.5</sub> with conventional air pollution control measures for Kazakhstan, 2030

# GAINS MODELING RESULTS: SYNERGIES BETWEEN CLIMATE AND AIR QUALITY MEASURES AVAILABLE BUT LIMITED

Blended conventional AP and CC mitigation measures

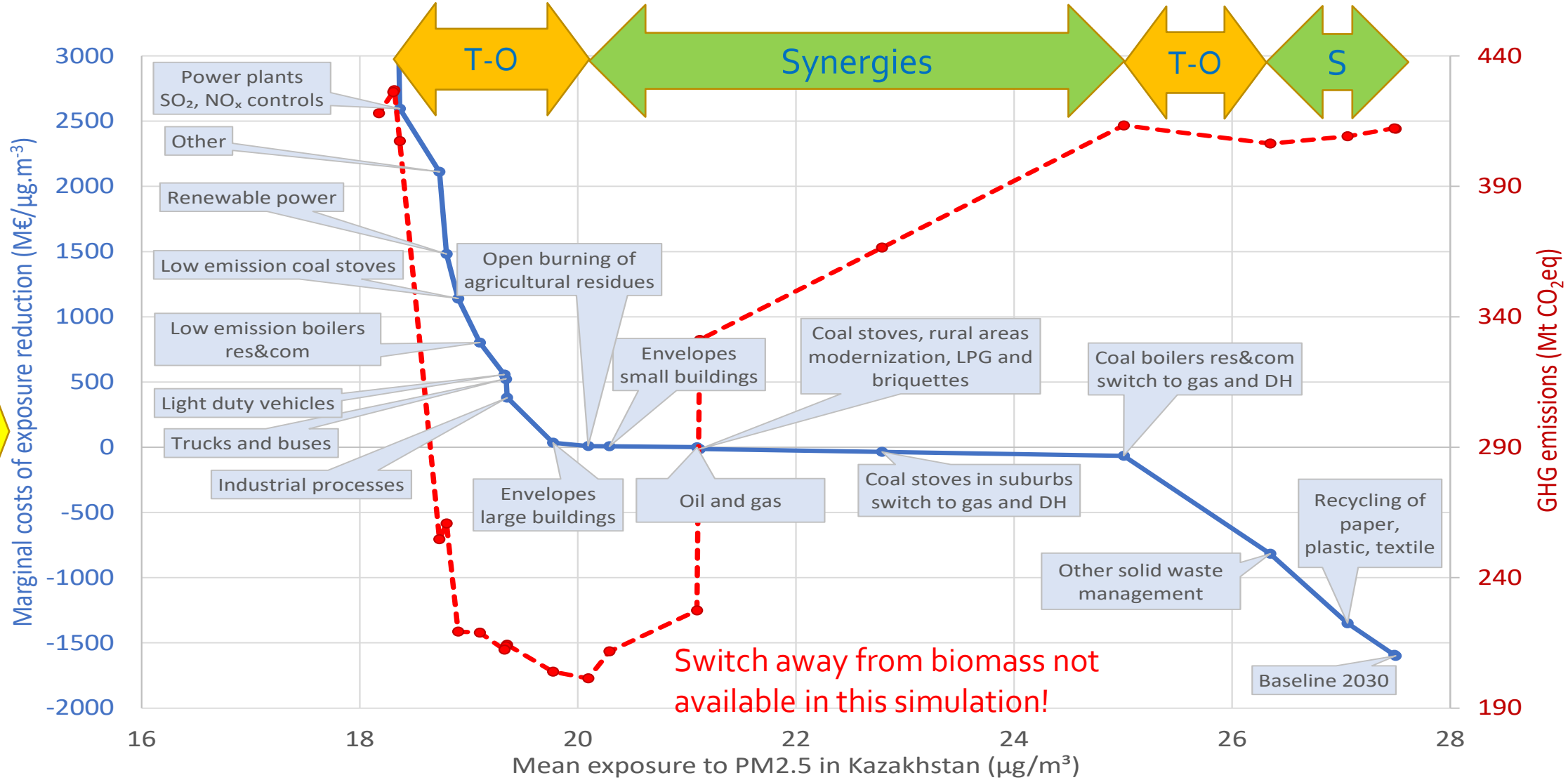


Marginal cost curve for population exposure to PM<sub>2.5</sub> in 2030

—●— Marginal costs

# GAINS MODELING RESULTS: SYNERGIES BETWEEN CLIMATE AND AIR QUALITY MEASURES AVAILABLE BUT LIMITED

Blended conventional AP and CC mitigation measures



Marginal cost curve for population exposure to PM<sub>2.5</sub> in 2030, along with the impacts of the measures on greenhouse gas emissions, using the GWP100 metric for SLCP

—●— Marginal costs    -●- GWP100 (SLCP)

**THANK YOU FOR YOUR ATTENTION**



**WORLD BANK GROUP**

**Air Quality Management and Climate Change Mitigation in Almaty**