Thailand Smart Cities Paper Outline

# Introduction

* Urbanization is driving rapid socioeconomic growth in Thailand, posing challenges for power systems
  + Population & GDP trends in Thailand & Bangkok
  + Energy demand trends in Thailand & Bangkok
  + Power system challenges: reliability, meeting peak demand
* Power development and urbanization must be in line with national RE expansion and emissions reduction goals
  + Overview of national goals/ commitments
  + Link to urbanization & energy demand growth challenges
* Bangkok’s Smart City plans address the challenges of maintaining power system reliability as urbanization continues while contributing to national emissions reduction goals
  + Overview of smart cities concept & Thailand Smart Grid Master Plan
  + Power sector (smart grid) component
    - MEA focus areas, technologies, and policies
    - Relevance to national goals/ commitments (e.g., LEDS)
* MEA (and other authorities?) need long-term planning tools to ensure that policy & technology implementation will be in line with local & national goals
  + Introduce integrated assessment modeling & GCAM
  + Benefits provided by GCAM analysis (climate change context, long-term assessment, technology analysis, holistic approach)

# Methods

## Scope

* Temporal scope (5-year timesteps through 2100)
* Spatial scope (national & 3 MEA provinces)

## GCAM inputs

* Population & GDP data sources and assumptions
  + Same pre-2010, post-2020 population & GDP growth rates for each province & national
  + Constant GDP growth rate after 2037
* Other input data & assumptions for breaking out cities
  + urban-rural shares in each subregion

## Scenario design

* Detailed sectoral policies (high/low ambition; MEA area/ rest of Thailand)
  + Power sector: increased wind & solar, coal phaseout
  + Buildings: increased energy efficiency of appliances, increased building shell efficiency
  + Transportation: decreased EV costs, CEV phase-out
  + Industry: increased energy efficiency overall
* Top-down emissions constraints (carbon neutral 2050/ net-zero 2065)
  + Basic constraint
  + Emissions constraint + negative land sink consistent with Thailand’s LTS
  + Emissions constraint + negative land sink + lower CCS

# Results

# Discussion

## Scenario comparison

* (Mandatory) National Policies vs Extended or global best practices
* Bangkok Smart Energy vs National Policies
  + What do the smart energy plans add that is not covered in the national policies?
  + (How do smart energy plans align with global best practices?)
* Carbon neutral & net zero Thailand vs other scenarios
  + How/ do what extent do existing national & smart energy plans contribute to the measures required to reach carbon neutral & net-zero goals?
  + Which existing areas/ policies will need stronger measures and what areas are “missing” from existing national & smart energy plans?
  + Include discussion of carbon neutral vs net zero scenarios
    - How do the necessary measures differ and are Bangkok smart energy/ smart cities measures implicated in this difference?

## Policy recommendations

* Based on above comparison, recommend focus areas and additional measures needed to reach national carbon neutral & net-zero goals given existing national & Bangkok policies/plans