

# Costa Rica: Developing a modeling framework for NDC Pathways

PMR Workshop – Paving the Way for NDC Implementation

San José, Costa Rica

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# Guiding questions

- How is the work relevant/useful to NDC?
- What are the specific policy/research/NDC-related questions of the exercise?
- What is the modeling/analytical framework and methodology used and why?
- ~~What are the key outcomes and/or illustrative results of the exercise?~~
- What critical success factors have been identified?

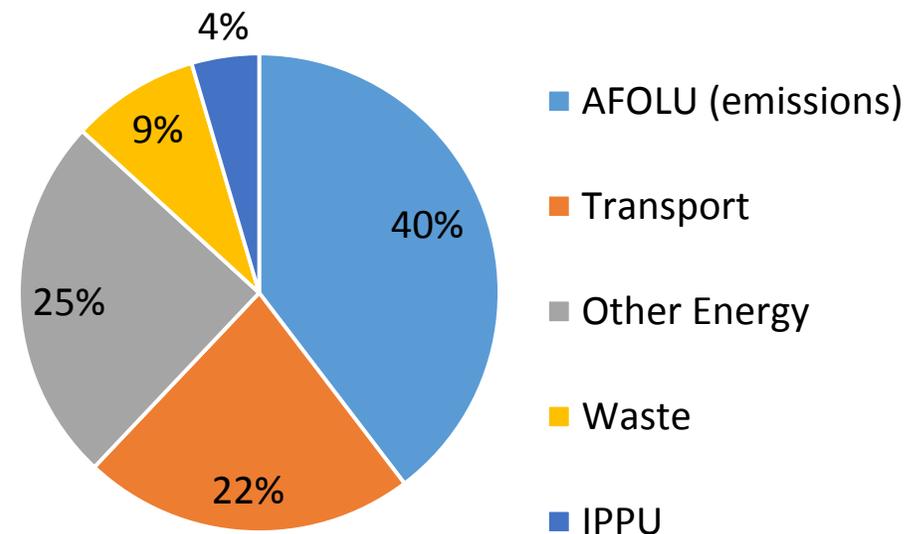
# CR Emissions Profile (2012)

- High ambition in our INDC, but support is required for transformational change to occur in the short-term, especially for agriculture and transport.

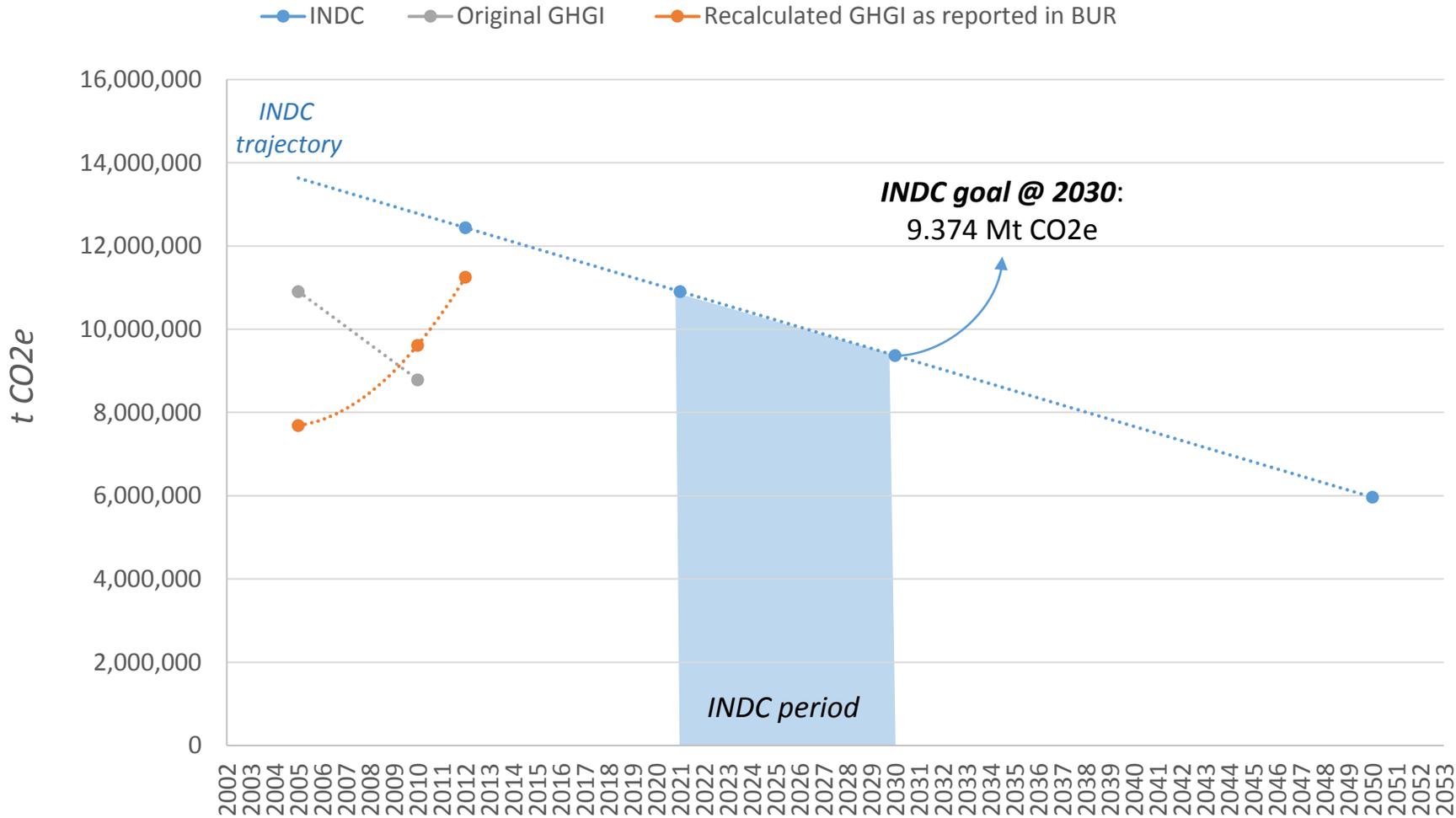
## Reported Emissions

- **Energy:** 7,213.83 Gg CO<sub>2</sub>e
- **IPPU:** 980.7 Gg CO<sub>2</sub>e
- **AFOLU:** 1,191.36 Gg CO<sub>2</sub>e (net)
- **Waste:** 1,864.31 Gg CO<sub>2</sub>e
- **Total:** 11,250.20 Gg CO<sub>2</sub>e

## Gross emissions by source



# NDC Trajectory



# Reported mitigation actions (BUR)

\* Pre-2021, pre-Paris Agreement and pre-INDC mitigation actions

Action	GHGI Sector	Scale	Goal (Mt CO <sub>2</sub> e)	Goal period	MRV'd outcomes (Mt CO <sub>2</sub> )	MRV period
<b>Domestic C-Market (C-brand)</b>	All	Organization	<i>TB Updated</i>	2021	Implicit in GHGI	2009-2012
<b>National Energy Plan</b>	Energy	National	<i>TB Updated</i>	2021	<i>Work in progress</i>	TBD
<b>National REDD+ Strategy</b>	AFOLU	National	31.5	2010-2025	8.8	2010-2013
<b>Coffee NAMA</b>	AFOLU	National	<i>TB Updated</i>	2024	<i>Work in progress</i>	TBD
<b>Livestock NAMA</b>	AFOLU	National	12.9	2028	<i>Work in progress</i>	TBD
<b>Waste water treatment</b>	Waste	Sub-national	TBD	TBD	<i>Work in progress</i>	TBD

- Goals and MRV are *emission reductions*

- CDM projects excluded from table. Overall expected contribution to mitigation: **0.2 M tCO<sub>2</sub>** during 2006-2006.

# Additional actions for *deep decarbonization*

- Costa Rica seeks to become a **national-scale laboratory for deep decarbonization** and has begun development and implementation of additional mitigation measures aligned with our NDC and key categories in GHGI:
  - Levy on mobile emissions sources
  - Levy on static emissions sources
  - Law for the Promotion of Electric Vehicles
  - Updating the Energy Efficiency Policy
  - Enabling conditions for distributed electrical generation project

- Costa Rica has been working on improving GHG emissions MRV and projection capacities
- For the BUR, this was done in an *ad hoc* basis with project developers, sectoral ministries and other stakeholders providing estimates
- Recognizing the importance of solid projections for long-term planning Costa Rica, through the support of the PMR-PAWP has started a national implementation of TIMES modelling platform
- TIMES is the most widely used, least-cost optimization methodology employed to inform energy (and water) policy and strategic planning, it was developed and is maintained by IEA-ETSAP

# Project Objectives

- Identify the policies and measures politically, technically, and economically feasible for Costa Rica
- Develop a country-specific energy systems model with input parameters validated and the resulting Baseline scenario approved by local experts and key stakeholders
- Develop a Planned policy scenario to assess existing and proposed mitigation policies and actions
- Develop Enhanced policy scenarios for Costa Rica to achieve its NDC targets made up of plausible mitigation policies and actions
- Build the local capacity so that experts can use the TIMES-CR model to advise policy on an ongoing basis

# Key requirements

- Sector coverage:
  - Primary modeling: bottom-up modeling of the energy and transport sectors
  - Secondary modeling: “external” inputs AFOLU, waste and IPPU sectors
- Modeling platform: transparent with user-friendly interface; flexible for changes of key assumptions, new scenarios, and allow soft-linking with other models, such as the Central Bank CGE Model and the SINAMECC
- The model and its interface will ideally be open-source and will not require licensing fees
- Time horizon: annual time steps up to 2050

What critical success factors  
have been identified?

# DWG Keys for success

Successful development and ongoing use of the TIMES-Starter model for Costa Rica (TIMES-CR) is going depend on five fundamental components

1. **Strong commitment** by the appropriate Ministries and other government agencies responsible for the actually implementation of the policy recommendations arising from the undertaking
2. **Engagement** of the key stakeholders in the energy sector to foster buy-in of the approach and the results
3. Access to the **best available data** to underpin the analytical framework
4. Employment of **best TIMES practices**, tools and techniques, as embodied in the TIMES-Starter platform
5. An appropriately **skilled group of technically astute experts** to be trained in the principles, operation and application of the TIMES-CR model

# Mind the Analysis Team

- Solid understanding of energy data
- Basic knowledge of energy technologies and how they are characterized, and associated units
- Very good understanding of working with (linked) Excel workbooks
- Familiarity with other energy system models (e.g., LEAP, MESSAGE, ENPEP, PLEXOS) a plus
- Background in operations research a plus
- Made up of transport, energy, economic, industrial and policy experts.

# Key AT responsibilities

- Assist with identifying data sources and understanding the quality of the data
- Participate in the capacity building process
- Follow the model development process by periodically reviewing the evolving model
- Gain a solid understanding of TIMES-CR (see next slide)
- Take over long-term stewardship of TIMES-CR
- **A successful AT requires sustained, long-term support**

# Integrate data-analysis broadly and deeply

- Conceiving TIMES as part of SINAMECC adds value to both
- Costa Rica's overarching transparency framework has **two main objectives**:



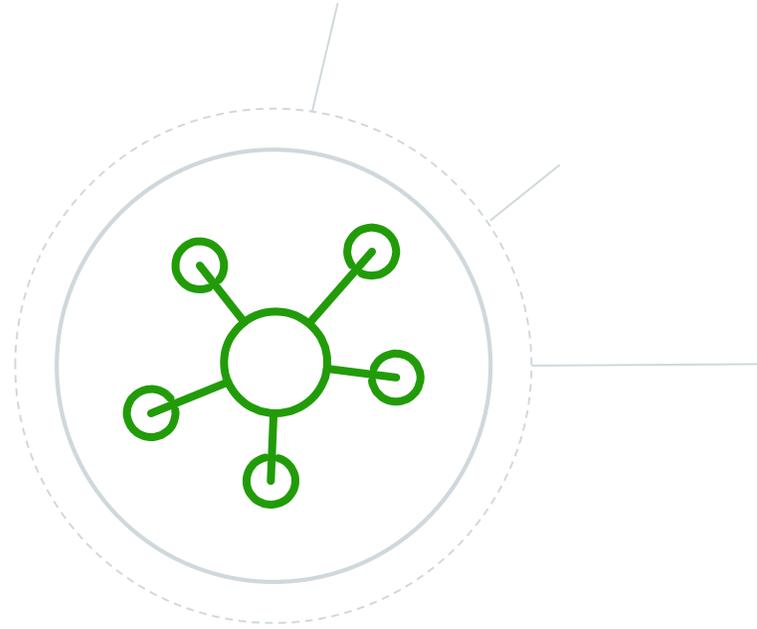
**Monitoring, and accounting** of public policies, including NDC goals



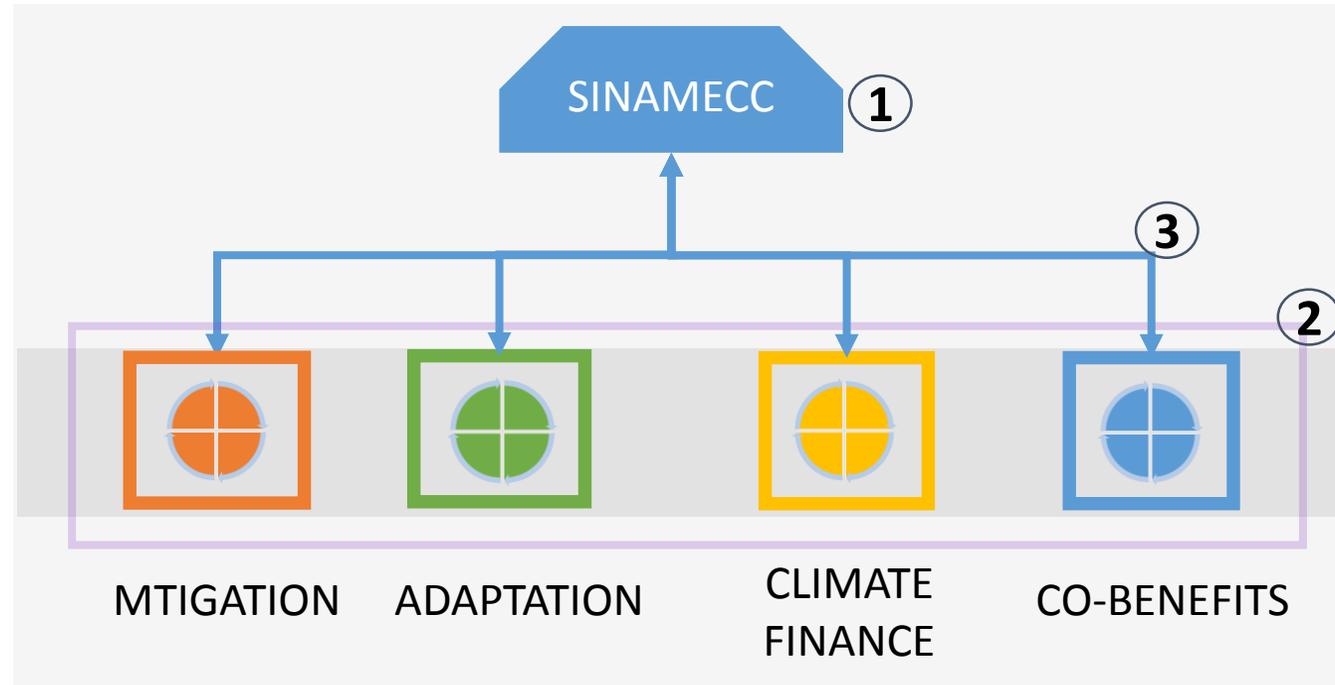
Enabling **data-driven** policymaking

# Systems-of- systems approach

Integrating multiple MRV  
schemes into one  
consolidated system



# SINAMECC's Structure



## 1. Core Capacities

- Local and international reporting
- Data visualization and open access
- Data-driven policymaking tools (TIMES, CGE)

## 2. Facilitating Framework

- Institutional agreements on data transfer
- Sustainability of data flows
- Interactions between institutions

## 3. Information flows

- Data Quality Assessment and Control
- Protocols and Methodologies
- Strengthening Data Supply and Demand

# It takes a village...

- Costa Rica is actively seeking ways to increase transparency, including **approved projects** with



to develop the:

***National Climate Change Metrics System - SINAMECC***