CAPSIM: A Decision Tool for CAREC Regional Planning and Policy Dialog

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Overview

- Regional economic integration is accelerating in Central Asia, significantly because of determined national and international commitments to infrastructure and other investments.
- This has been complimented by substantial progress on the institutional side, promoting a more open multilateral trade and investment environment.
- In a rapidly evolving regional economy, however, decision makers need support for more evidence-based strategic planning and engagement.
- This project develops a new generation of decision tools for economic analysis and policy dialog, nationally, regionally and with international development partners.

How evidence-based forecasting can help policy

- Ex ante perspective: look before you leap
- Identify/quantify impacts:
  - Reduced costs (TTT, VOC, time, etc.)
  - Expanded investment horizons
  - Larger markets
- Transport vs. Development – capture integrated economic activities and indirect longer term impacts
- Trade creation vs. trade diversion
- Second-generation infrastructure
- Adjustment assistance
- Support dialog generally
  - Public: local, national, regional coherence/coordination
  - Private: arouse private stakeholders to complete the Commitment Game

CAPSIM:
Central Asian Policy Simulation Model

- The basic architecture of this regional modeling facility is based on a global prototype designed at the University of California, Berkeley.
- This combines a multi-country Computable General Equilibrium (CGE) forecasting model with an interactive, user-friendly, browser-based interface.
- To protect confidentiality of official data, these tools are designed to be implemented on local computers rather than the Internet.
- Local policy researchers can vary input data and scenario assumptions and assess long term regional impacts and implications.

Basic CAPSIM Ingredients

Like all good economic policy, CAPSIM stands on two legs, highest quality data and analytical methods:

- Data: A country-by-country, integrated database for assessing economic linkages, policy and market outcomes, energy flows, and environmental impacts
  - Calibrated to GTAP-8, plus estimated Social Accounting Matrices for other CAREC economies
  - Up to 57 sectors/commodities
  - Annual projections to 2030
- Method: A state-of-the-art, forward looking economic scenario tool – downscaled from a global CGE developed at UC Berkeley

Available Data

		GTAP 8	Last I-O Table
1	Afghanistan		None
2	Azerbaijan	Yes	
3	Kazakhstan	Yes	
4	Kyrgyz Republic	Yes	
5	Mongolia	Yes	
6	Pakistan	Yes	
7	People's Republic of China	Yes	
8	Tajikistan		1995
9	Turkmenistan		1995
10	Uzbekistan		1995
11	Russian Federation	Yes	
12	Rest of former USSR	Yes	
13	India	Yes	
14	Rest of South Asia	Yes	
15	High Income Asia	Yes	
16	Rest of Asia	Yes	
17	EU	Yes	
18	USA	Yes	
19	Rest of World	Yes	

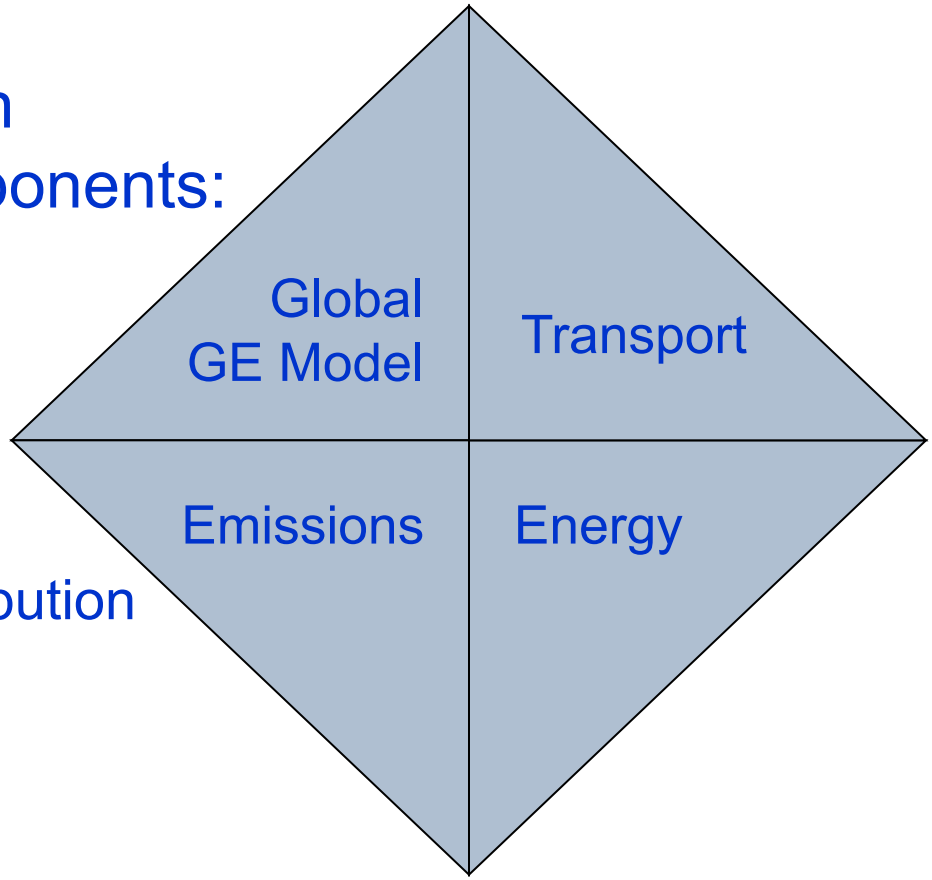
Other Candidates

- Xinjiang UAR
- Inner Mongolia AR

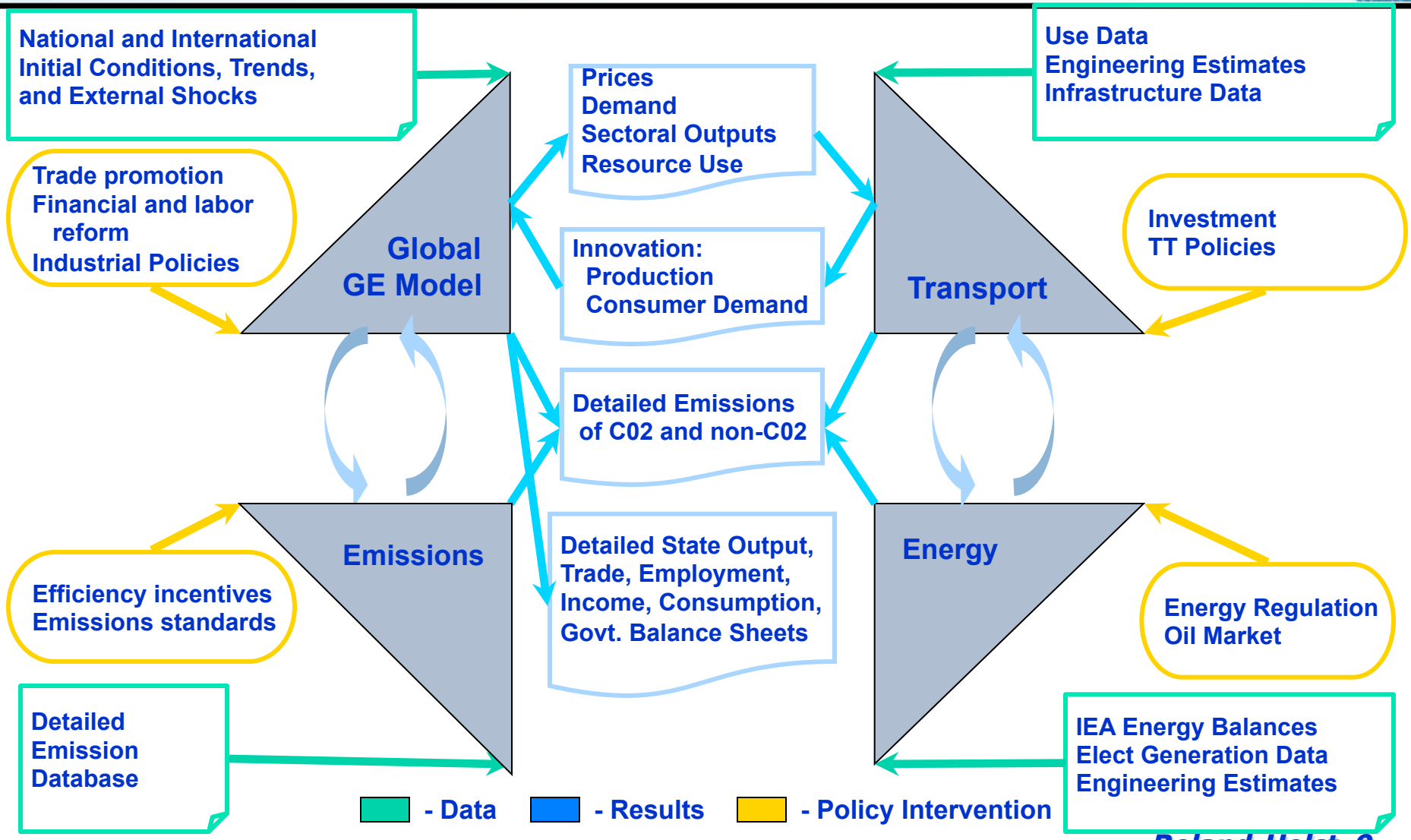
How we Forecast

The CGE model has been developed in four components:

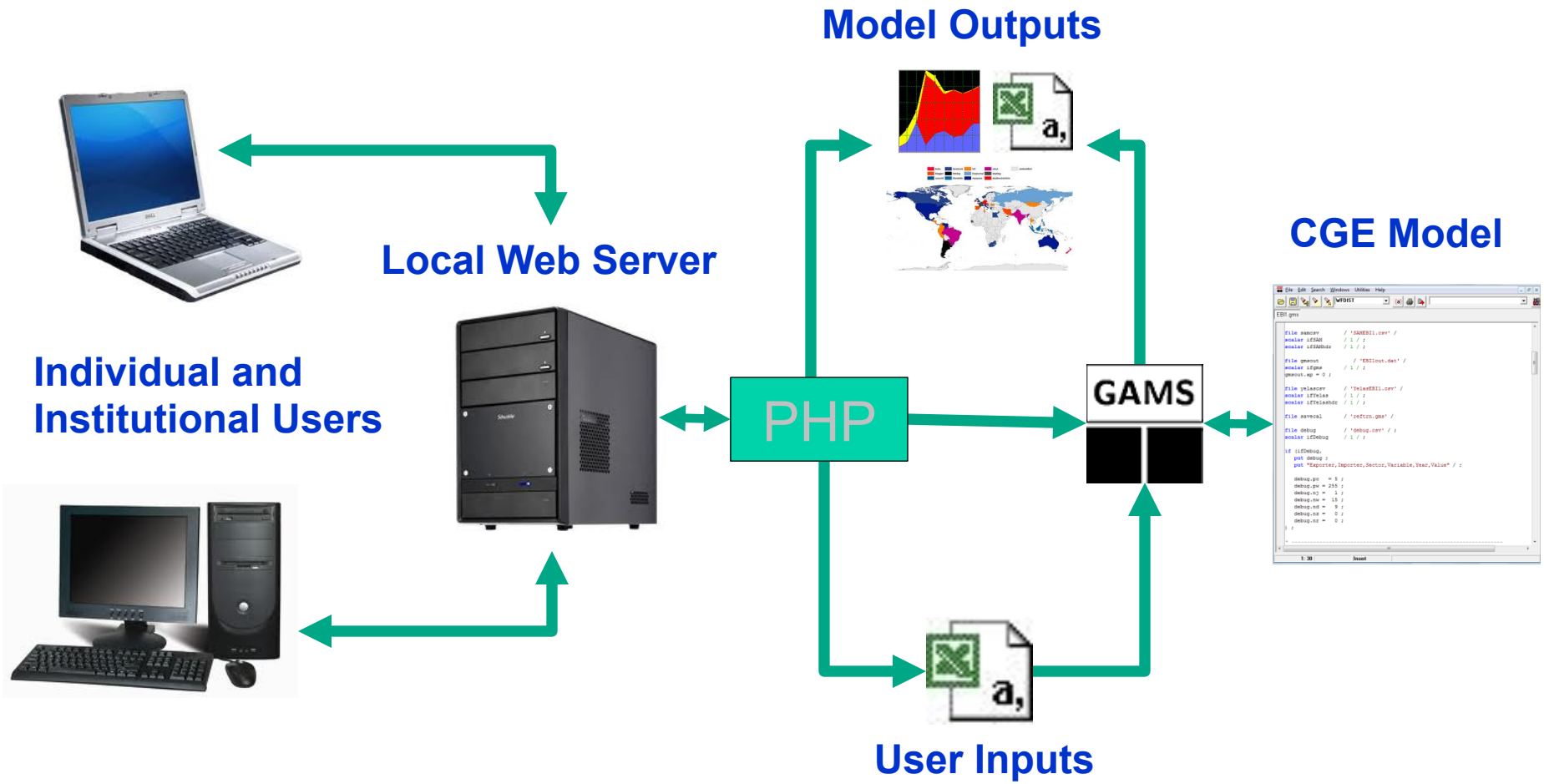
1. Core GE model
2. Transport module
3. Energy production/distribution
4. Emissions module



Detailed CGE Framework



CAPSIM System Architecture



Sample Model Inputs: CAREC Modeling Scenarios

Transport and Infrastructure

Regional corridor schemes for national, regional, and global perspectives

Regional implications of national investments

Motorization and urbanization

Trade Facilitation and Trade Policy

Asian regional integration – national, regional, and global implications

Bilateral and regional TT measures

Integrated Trade Facilitation

Energy Policy

Strategy for Regional Cooperation in the Energy Sector

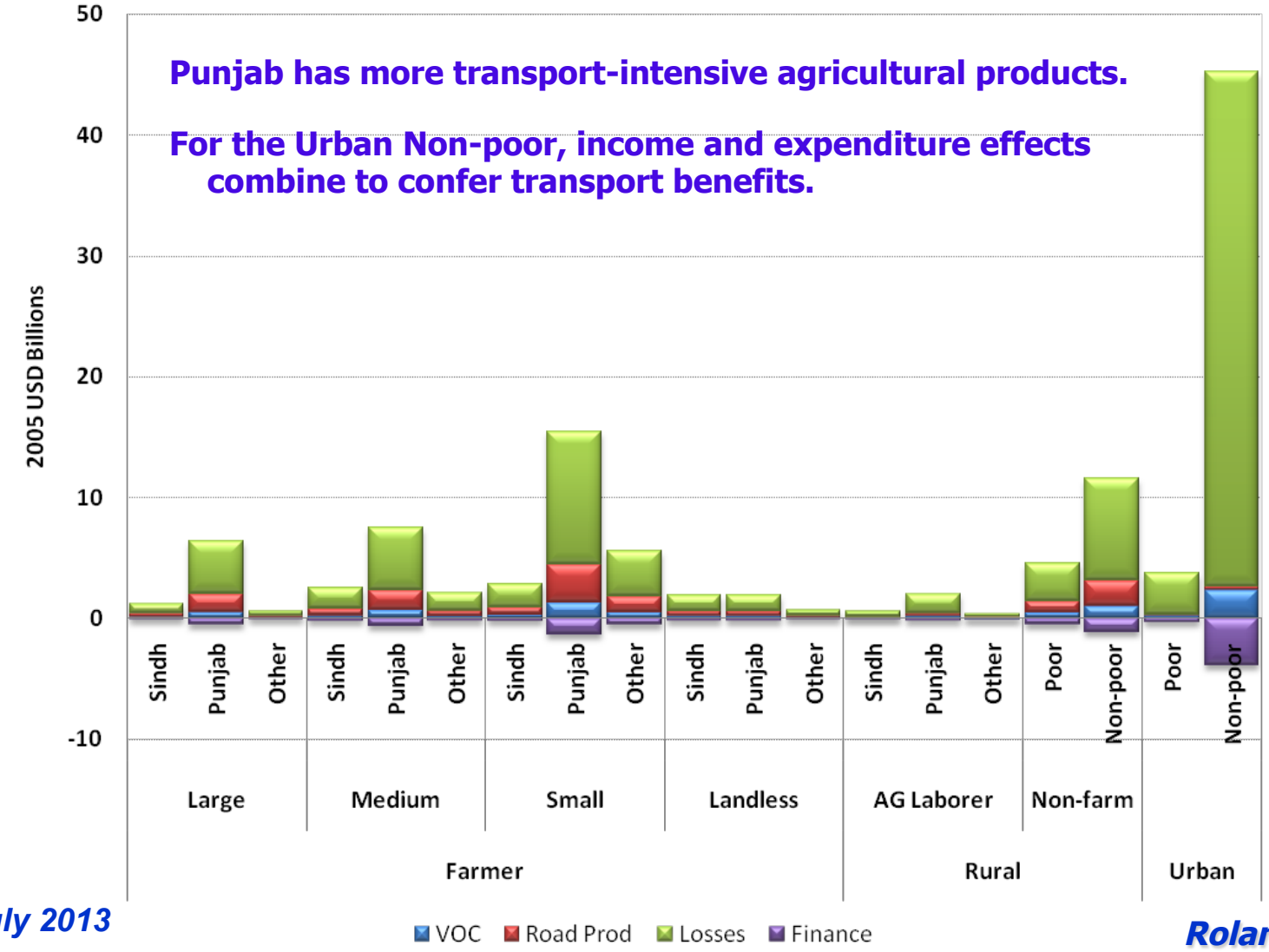
Energy Action Plan Framework

Regional energy security

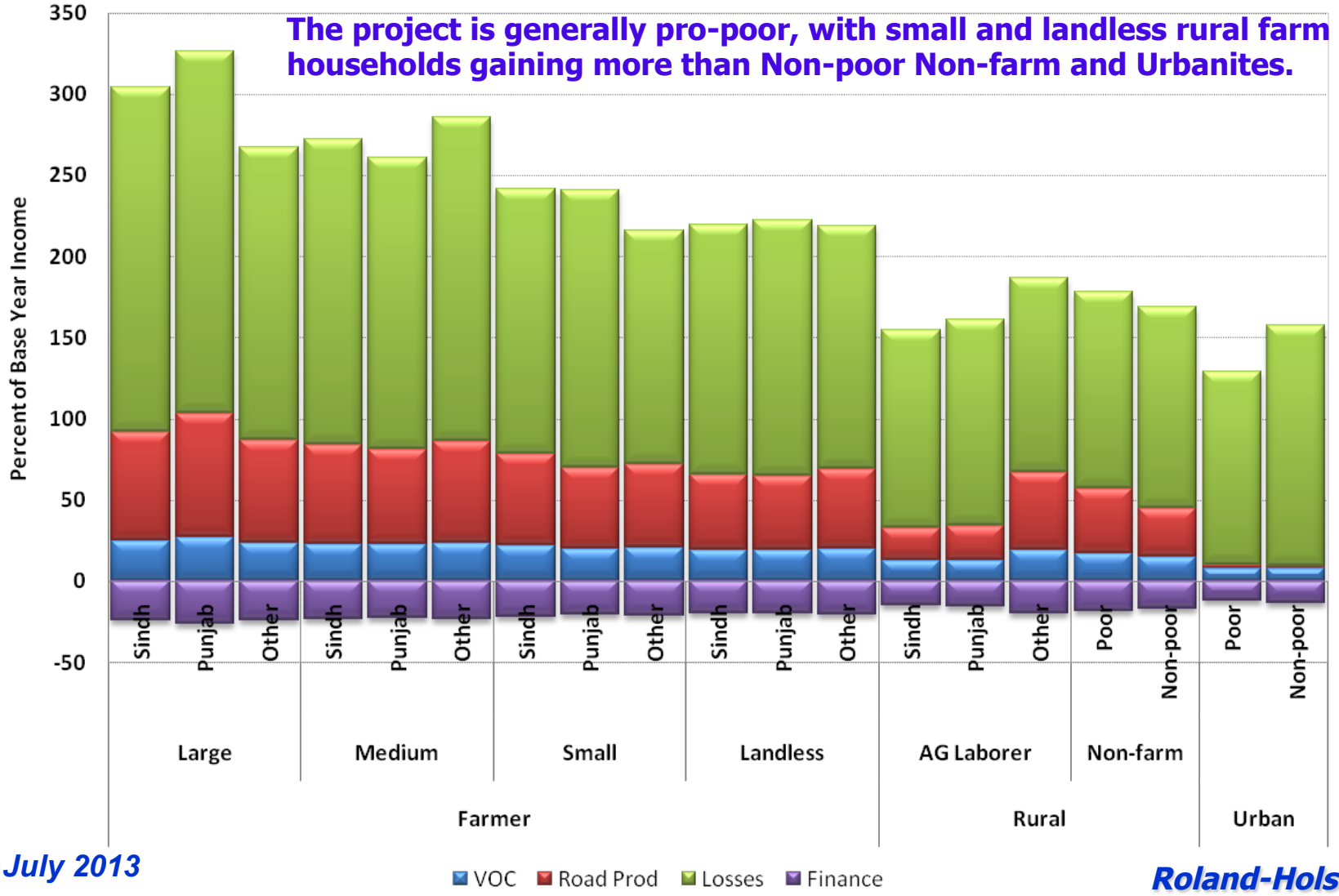
Sample Model Outputs: What we forecast

Category	Variables
Economic Structure	Sectoral output, demand, imports, and exports for each country.
Income	Total and per capita GDP by region Value added by sector by region Household income by household category
Employment	Total employment by sector by region Employment rates by household category
Energy	Total energy use by sector by region Energy mix by region Energy use by household category
Emissions	GHG emissions (CO_2, CH_4, N_2O) by source, use, and region

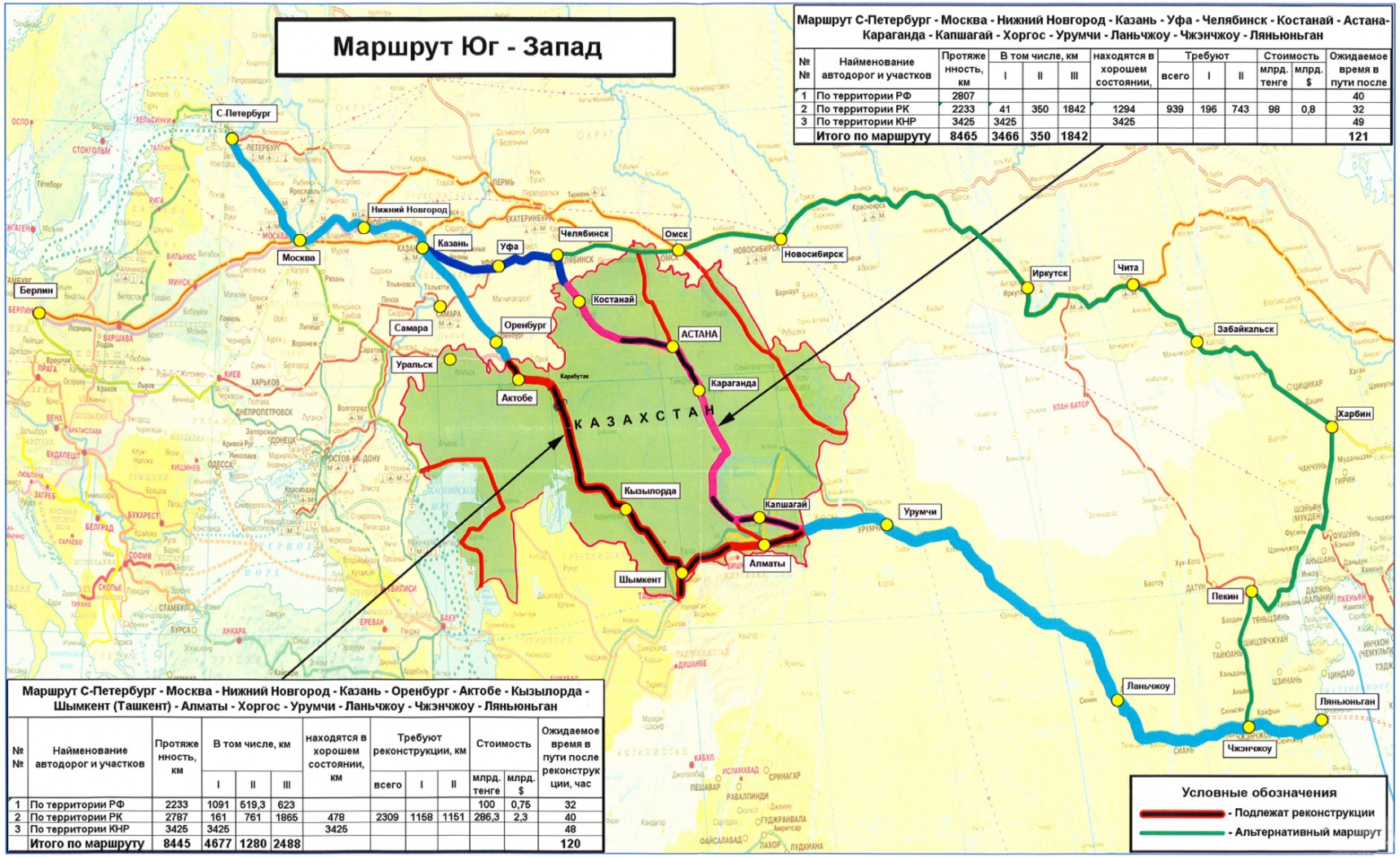
Example 1: Pakistan Northern Corridor Household Real Income Growth Cumulative Over Baseline, Pakistan 2006-2030



Household Income Growth as a Percentof 2006 Pakistan Income



Example 2: Kazakhstan Corridor



Маршрут С-Петербург - Москва - Нижний Новгород - Казань - Уфа - Челябинск - Костанай - Астана - Караганда - Капшагай - Хоргос - Урумчи - Ланьчжоу - Чжэнчжоу - Ляньюньган

№ №	Наименование автодорог и участков	Протяженность, км	В том числе, км			находятся в хорошем состоянии,	Требуют			Стоимость		Ожидаемое время в пути после
			I	II	III		всего	I	II	млрд. тенге	млрд. $	
1	По территории РФ	2807										40
2	По территории РК	2233	41	350	1842	1294	939	196	743	98	0,8	32
3	По территории КНР	3425	3425			3425						49
	Итого по маршруту	8465	3466	350	1842							121

Маршрут С-Петербург - Москва - Нижний Новгород - Казань - Оренбург - Актобе - Кызылорда - Шымкент (Ташкент) - Алматы - Хоргос - Урумчи - Ланьчжоу - Чжэнчжоу - Ляньюньган

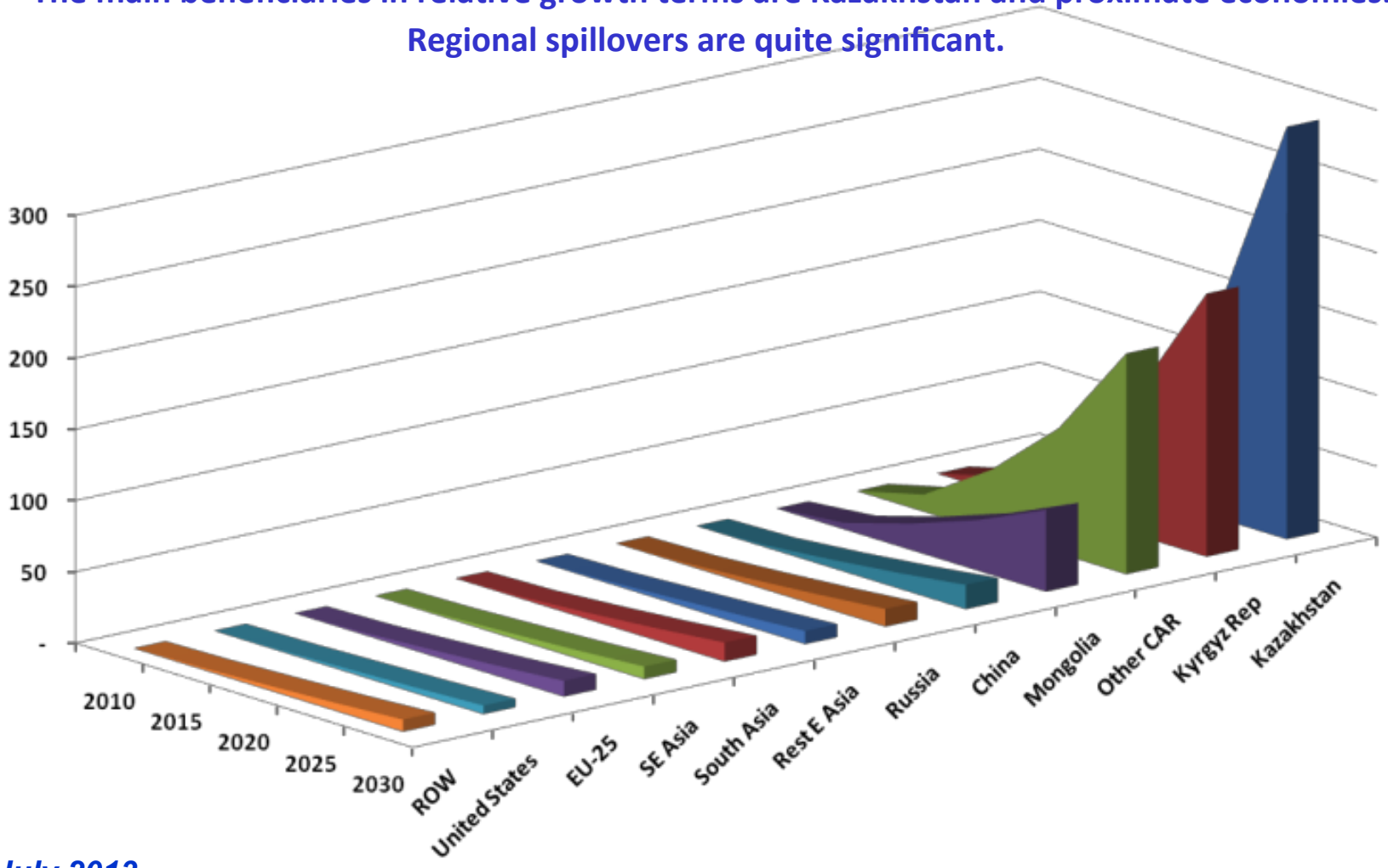
№ №	Наименование автодорог и участков	Протяженность, км	В том числе, км			находятся в хорошем состоянии, км	Требуют реконструкции, км			Стоимость		Ожидаемое время в пути после реконструкции, час
			I	II	III		всего	I	II	млрд. тенге	млрд. $	
1	По территории РФ	2233	1091	519,3	623					100	0,75	32
2	По территории РК	2787	161	761	1865	478	2309	1158	1151	286,3	2,3	40
3	По территории КНР	3425	3425			3425						48
	Итого по маршруту	8445	4677	1280	2488							120

Условные обозначения
- Подлежат реконструкции
- Альтернативный маршрут

Real GDP Growth

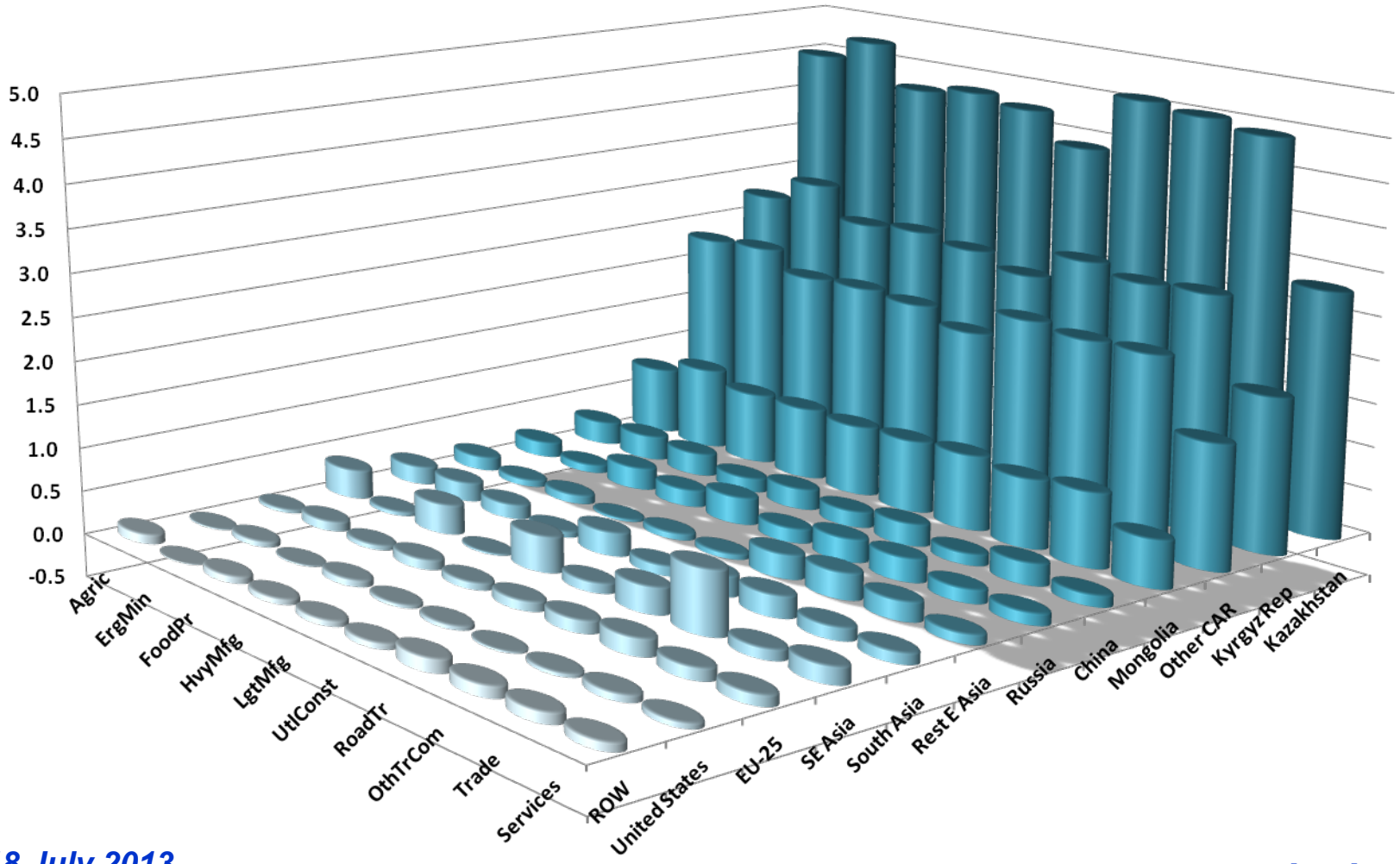
(Percent of 2010, annual with respect to Baseline)

The main beneficiaries in relative growth terms are Kazakhstan and proximate economies. Regional spillovers are quite significant.



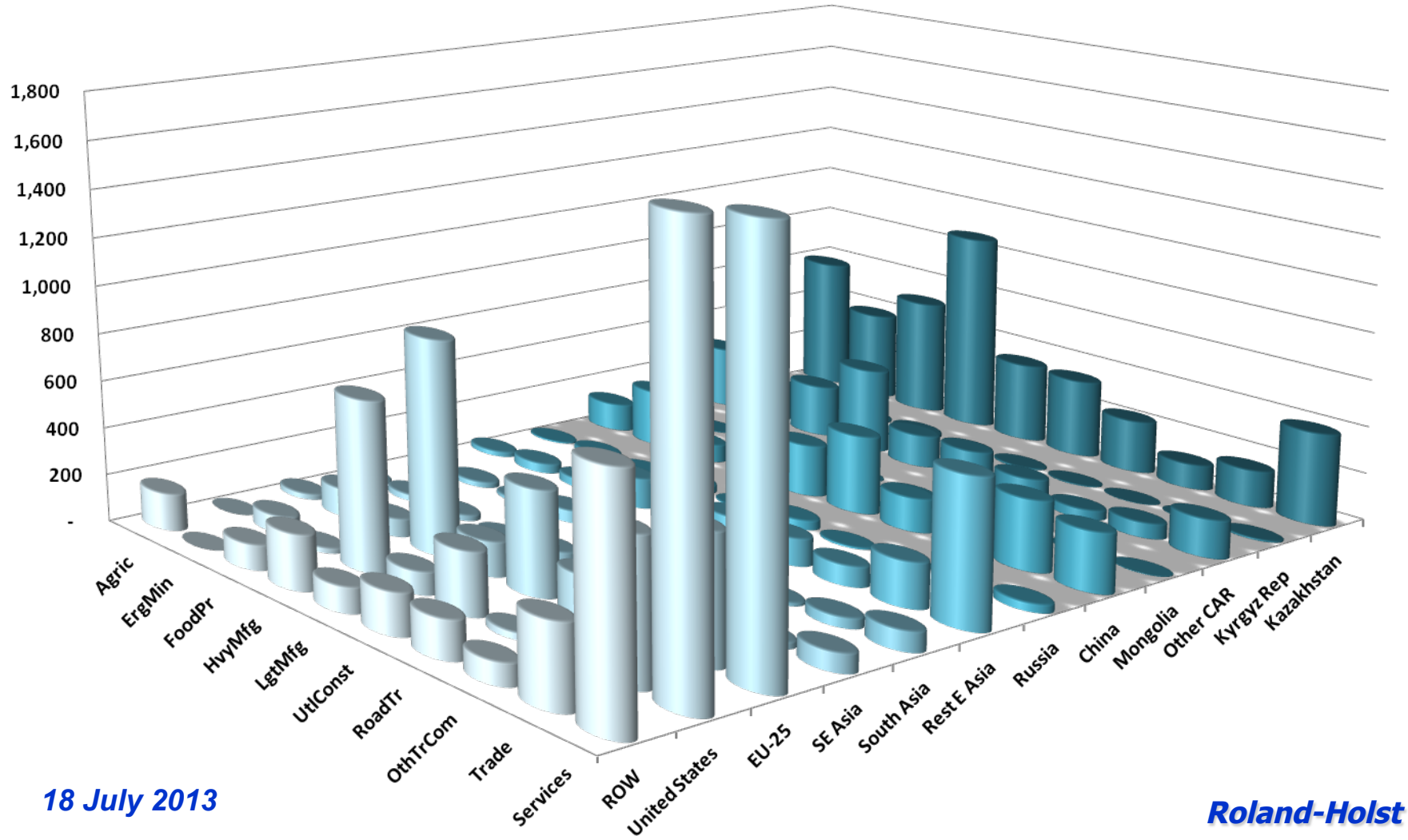
Sectoral Output Growth
(Multiple of Baseline in 2030)

Sectoral benefits are relative uniform for local economies, more varied for trading partners.



Sectoral Output Growth
(USD 2010 Millions wrt Baseline in 2030)

Nominal gains are much more varied, depending on initial scale and trade shares.



Extensions

1. Regional assessment of trade and investment potential and trends.
2. Transport corridors: Detailed regional and national impact analysis.
3. Energy pathways: Detailed regional and national impact analysis.
4. Dynamics of regional growth and poverty reduction.
5. Trends in urbanization and rural development.
6. Resource development, public investment, and fiscal sustainability.
7. Demographic assessment, including impacts of migration, labor force development and employment patterns, and other socioeconomic trends.
8. Public policy impacts on development indicators, MDG's, etc., nationally and regionally.
9. Coordination with agent-based GIS modeling to improve policy targeting and impact evaluation.

The Policy Dashboard

CAPSIM represents a new generation of policy simulation models, combining

- Detailed structural data
- State-of-the-art forecasting model
- User-friendly, interactive, interface with real time numerical and graphic results

The Policy Dashboard interface allows ex ante visualization of policy impacts.

Demonstration

- Now we switch to a browser.

Issues

- Economic data – must be seen as indicative for some countries
- Inputs – which are relevant to CAREC policy research?
- Outputs – likewise
- Capacity standards – uniform across implementations or adaptive
- ADB capacity – where do you want to take this?

Thank you