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CENTRAL ASIA AND CASPIAN REGION STAKEHOLDER DISCUSSION SERIES (Workshop 3), May 18, 2021



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Introduction to the third workshop

***Modelling update following second stakeholder workshop –
3rd round of TIMES-CAC explorations***

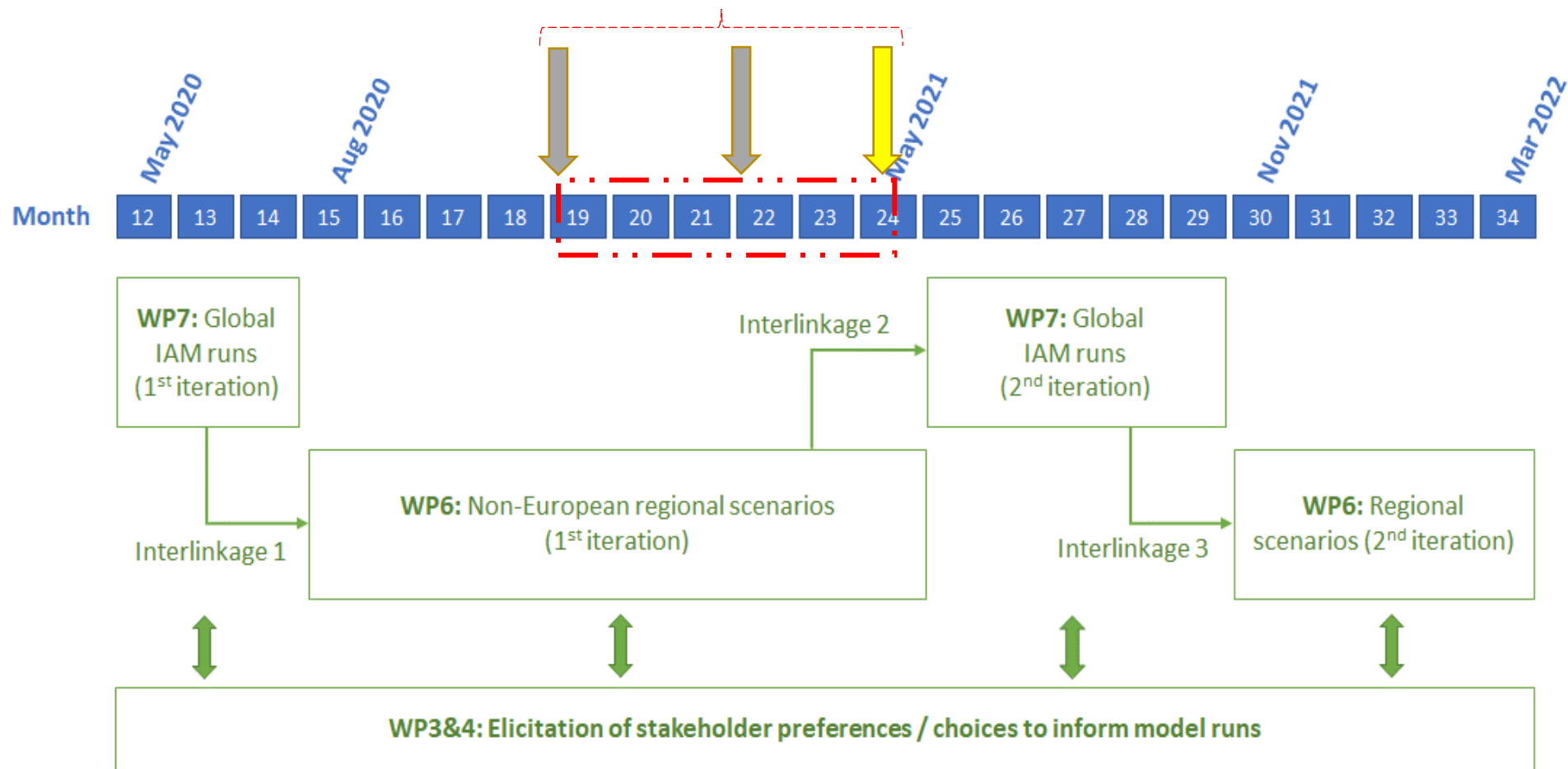
Rocco De Miglio (E4SMA srl)

Gabriele Cassetti (E4SMA srl)

14:00 – 14:10	Introduction to the third workshop	<i>Project team and Rocco De Miglio (E4SMA)</i>
14:10 – 14:45	Modelling update following second stakeholder workshop	<i>Rocco De Miglio (E4SMA)</i>
14:45 – 15:00	<i>Tea & coffee break</i>	
15:00 – 15:50	Stakeholder discussion on relevant regional topics	<i>Open discussion format (guided by Rocco De Miglio and Gabriele Cassetti)</i>
15:50 – 16:00	Conclusions	<i>Project team</i>



The Central Asian Caspian region: *a virtuous demand-driven process over 3 workshops*



Key topics (stakeholder dialogue – March-May)

Recent energy- climate- related documents/studies (policies, strategies and RES)

- Numerical updates – Available/public reports. Willing to cross-check our inputs/design/ findings with other studies

“Watergy”

- Activation of (part) the “water module” for the TIMES-CAC model
- Definition of water-related scenario elements

Tariffs

- Cross-check of the end-use tariffs (base year) per country per sector
- Assumptions about their evolutions (scenario elements)

Dashboard (updated version)

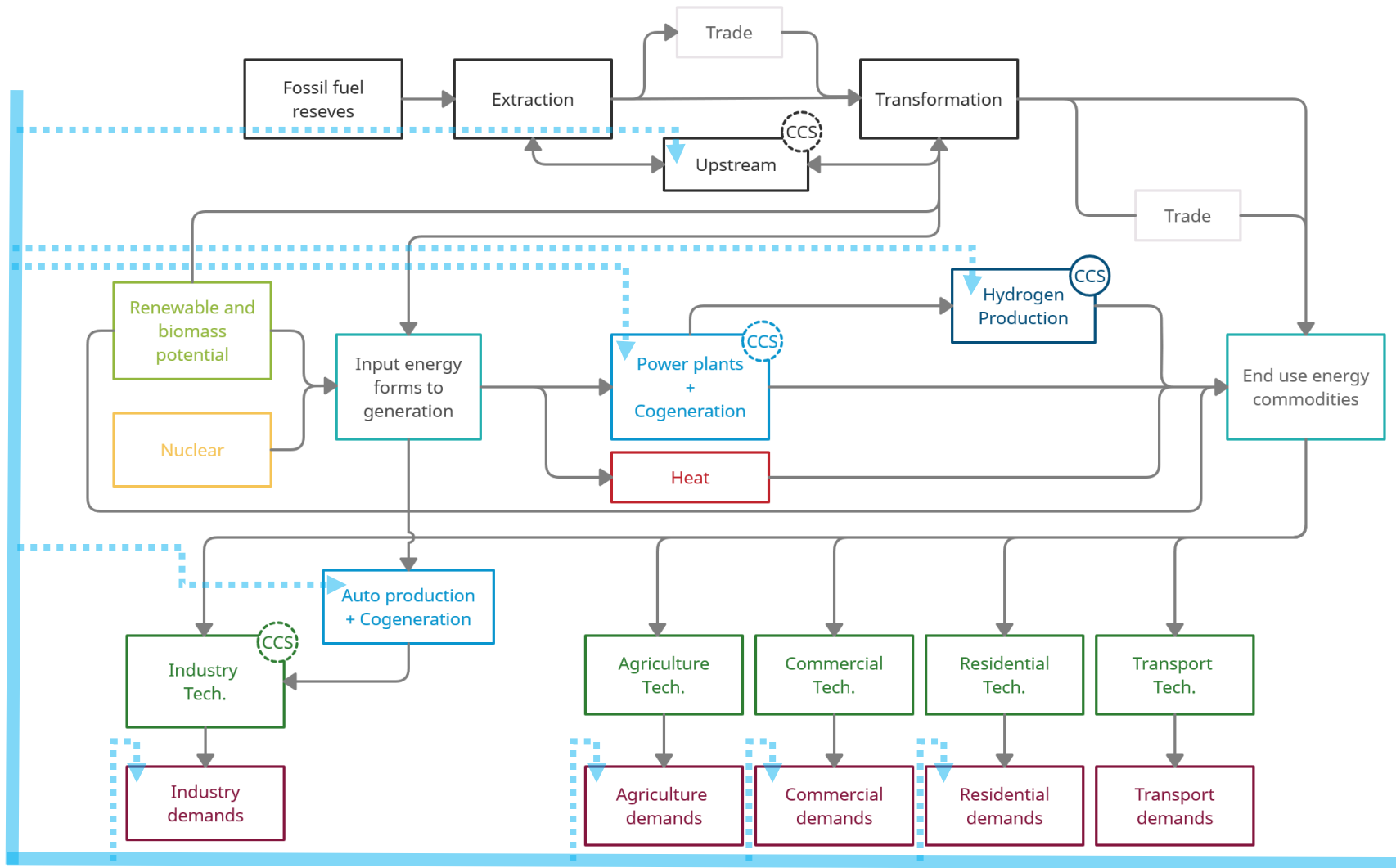
- Additional KPI and other minor cosmetic changes

Future dialogue

- Set-up of a community space (forum)



Reference Energy System - Water



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Water consumption control

Dry cooling options

Emissions control/standards

Sustainability (+)

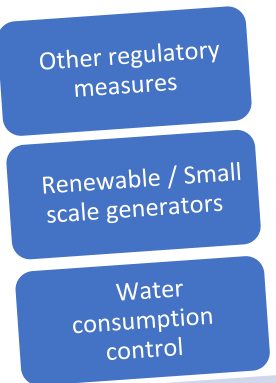
Sustainability (-)

Sustainability (+)

Sustainability (-)

Sustainability (+)

Sustainability (-)



Trade-offs must be considered !!!



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Residential/business electricity tariffs.

Data updated to 2020 for majority of countries.

Sectoral information partially available. *Subsidies assumed to decrease and cease by 2030-2035.*



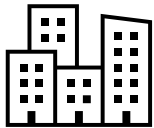
Retail gas prices, sectoral information where available.

Different reference years available. *Subsidies assumed to decrease and cease by 2030-2035.*



Gasoline, diesel, LPG, methane prices where available (international websites mainly).

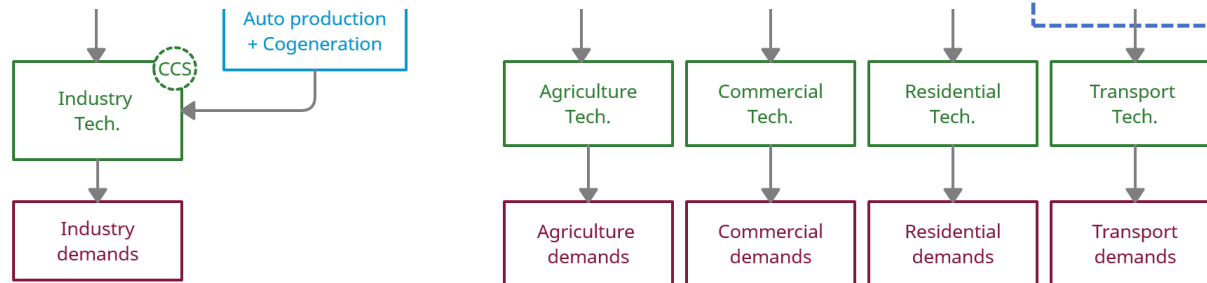
Data updated to 2021 for majority of countries.



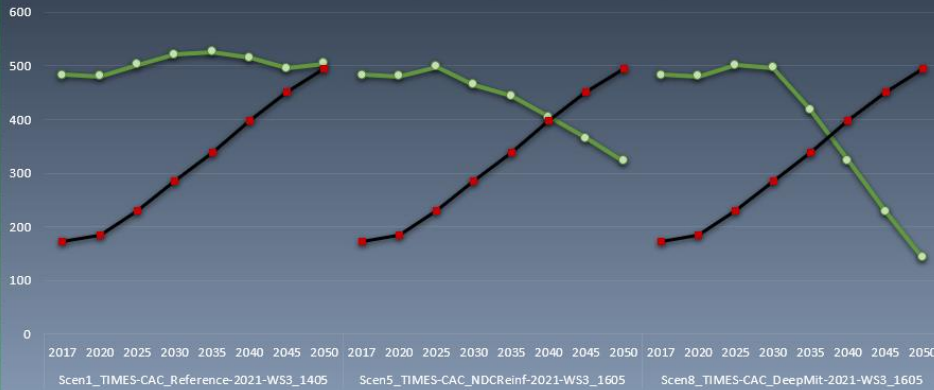
Central heating/hot water tariffs for residential customers.

Different reference years available.

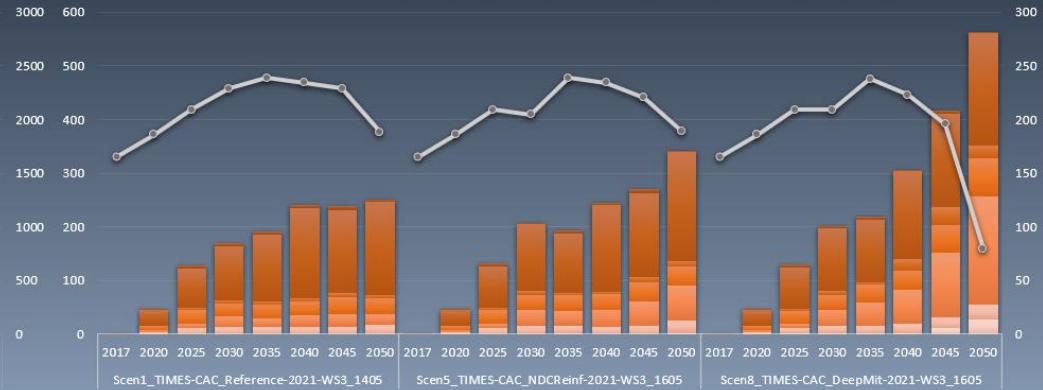
Main references: country documents by international organizations (e.g IRENA,IEA), Ministry publications from national/international websites



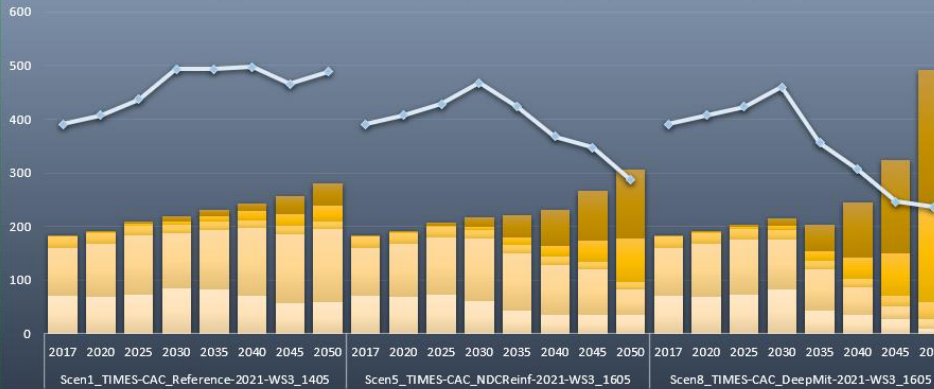
Emissions (MtCO₂eq) / GDP (billion USD)



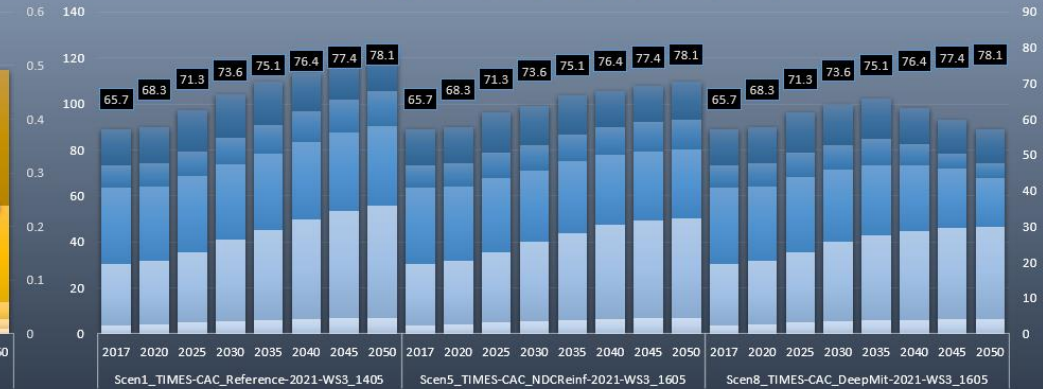
Investment Costs - LumpSum per period (billion USD) / Oil - gas net export (Mtoe)



Electricity generation - excluding autoproduction (TWh) / Water consumption (Gm³)



Final energy consumption (Mtoe) / Population (million)



- Scen1_TIMES-CAC_Refer...
- Scen2_TIMES-CAC_Refer...
- Scen3_TIMES-CAC_Refer...
- Scen4_TIMES-CAC_NDC-2...
- Scen5_TIMES-CAC_NDCR...
- Scen6_TIMES-CAC_NDC-2...
- Scen7_TIMES-CAC_RegSc...
- Scen8_TIMES-CAC_Deep...
- AZJ
- KZK
- TKM
- UZB



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You can download the "Dashboard" v1805 from the forum



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Key dimensions of the explorations and co-creation

National Climate
ambitions
(2030 and beyond)

Regional Climate
ambitions (long-term)

International energy
prices

Technology standards

Water consumption
(power sector)

H2 market (I/E)

Promotion of H2
domestic use

Regional integration -
cooperation

- Water availability
- H2 market
- Trades / Trading schemes

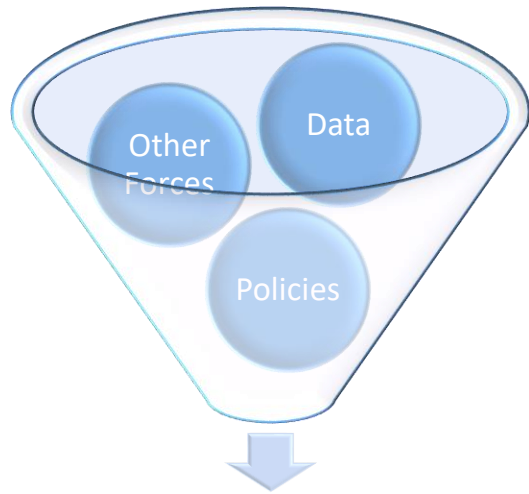
Belt and Road
Initiative

Other international
funds (allocation)

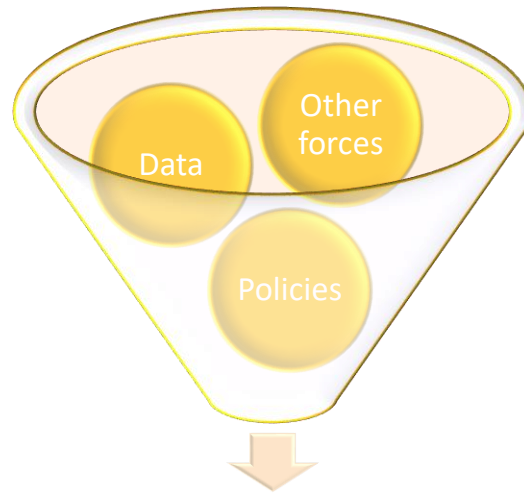
Tariffs
(energy subsidies)

Variants/Uncertainties
(prices, technologies,
targets)

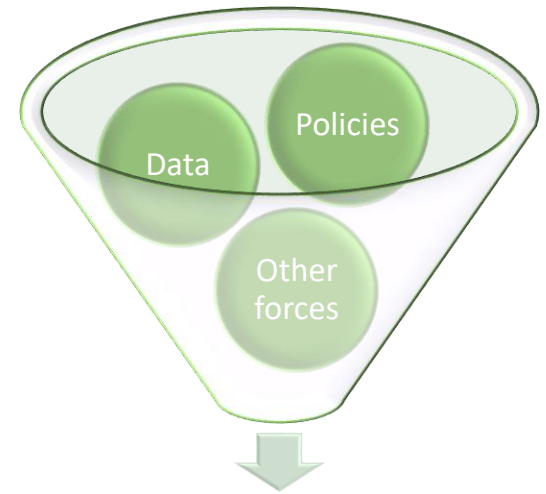




WWH (2050)



NDC-like (2050)



Deep Mitigation (2050)



WWH (and variants)

2030 fossil fuel prices (PR):
Oil: 93\$/barrel
Natural gas W dir.: 8.4 \$/Mbtu
Natural gas E dir.: 7.2 \$/Mbtu
Coal: 70 \$/ton

International energy prices

Fossil fuel prices after 2030. Oil 2040 Low: 56 \$/barrel; Coal price decreasing over time.

Water consumption (power sector)

Water consumption module:

- Enabled with no upper limit
- Enabled with upper limit (equivalent to current water consumption)

"Phase-out" of energy subsidies (*variant*)

Commodity tariffs:
Electricity: 0 – 5.3 UScents/kWh
Natural gas: 0 – 6.3 UScents/m3
Gasoline: 0.42 – 0.67 US/liter
DH: 0 – 1.50 USD/pers./month

Tariffs (energy subsidies)

Variants/Uncertainties (prices, technologies, targets)



NDC (and variants)

National Climate ambitions

Targets 2030, and “stabilization” after 2030:

KZK: **-15%** by 2030 / **-25%** by 2050 (wrt 1990)

AZJ: **-35%** by 2030 / **-40%** by 2050 (wrt 1990)

TKM: up to **+25%** by 2030 (wrt 2000) → *based on GDP growth*

UZB: up to **+14%** by 2030 (wrt 1990) → *based on GDP growth*

Water consumption (power sector)

No upper limit / low water consumption (*variant*)

“Regional” scheme (common carbon price for power sector emissions): up to 50\$/t CO₂e in 2050

Regional integration - cooperation

(Delayed) conditional 2030 targets - Higher long-term ambitions by 2030

KZK: **-50%** by 2050 (wrt 1990)

AZJ: **-60%** by 2050 (wrt 1990)

TKM: **-35%** by 2050 (wrt 2000)

UZB: **-30%** by 2050 (wrt 1990)

Variants/Uncertainties (prices, technologies, targets)



DM (benchmark)

National Climate
ambitions

Deep mitigation targets beyond 2030:

KZK: -15% by 2030 (wrt 1990), **-80%** by 2050 (wrt 1990)

AZJ: -35% by 2030 (wrt 1990), **-80%** by 2050 (wrt 1990)

TKM: up to +5% by 2030 (wrt 2000), **-70%** by 2050 (wrt 2000)

UZB: up to +5% by 2030 (wrt 1990), **-75%** by 2050 (wrt 1990)

Key principle: 2060 (and beyond) net-zero visions

CCS technologies: active
(for Azerbaijan and
Kazakhstan only)



Paper: *Greening China's BRI in Central Asian Countries: the role of hydrogen in the near-zero carbon emissions future.* Submitted to the journal: **One Earth (Cell Press)**

National Climate
ambitions
(2030 and beyond)

Technology standards

H2 market (I/E)

Promotion of H2
domestic use

Regional integration -
cooperation

- H2 market
- Trades

Belt and Road
Initiative

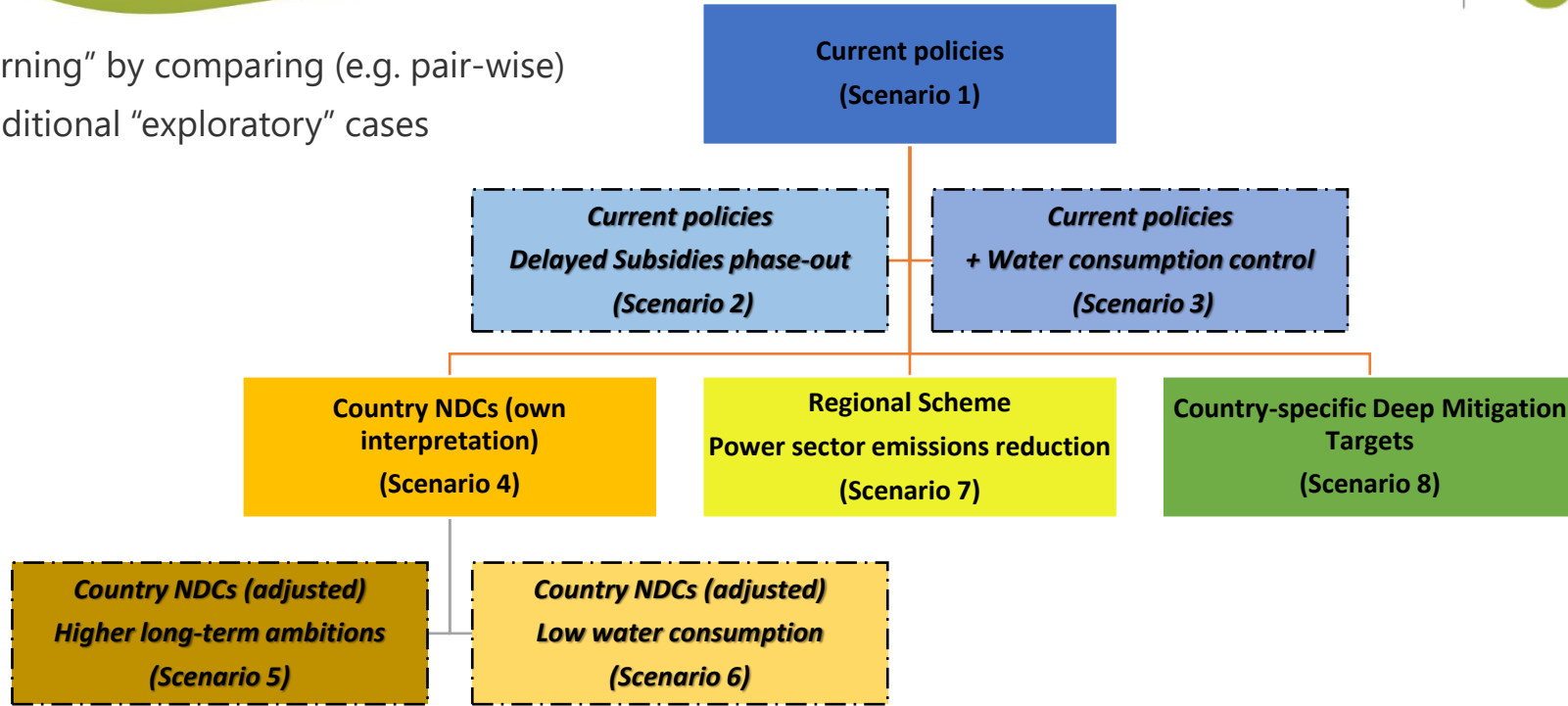
Authors: Xi Yang, Rocco De Miglio, Gabriele Cassetti



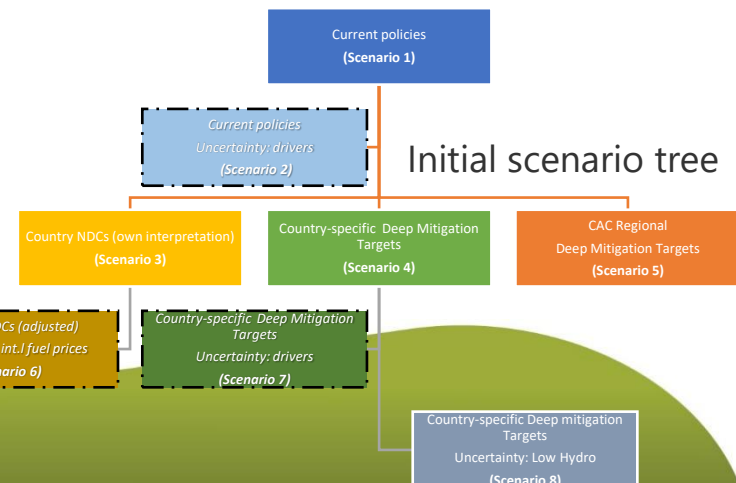
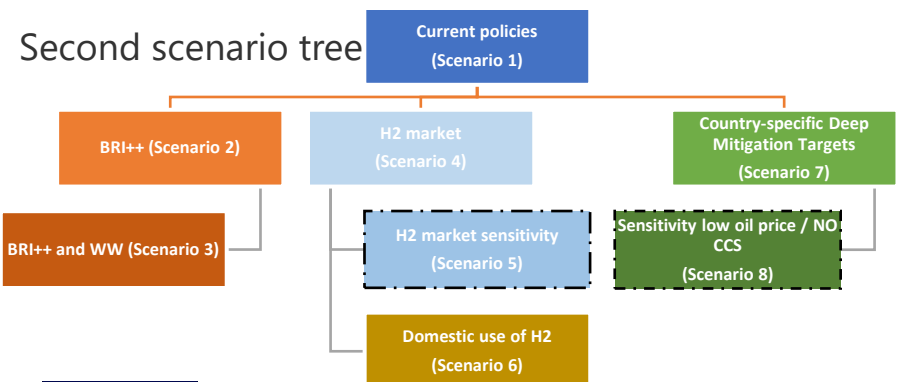
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Third scenario tree

- "Learning" by comparing (e.g. pair-wise)
- 8 additional "exploratory" cases

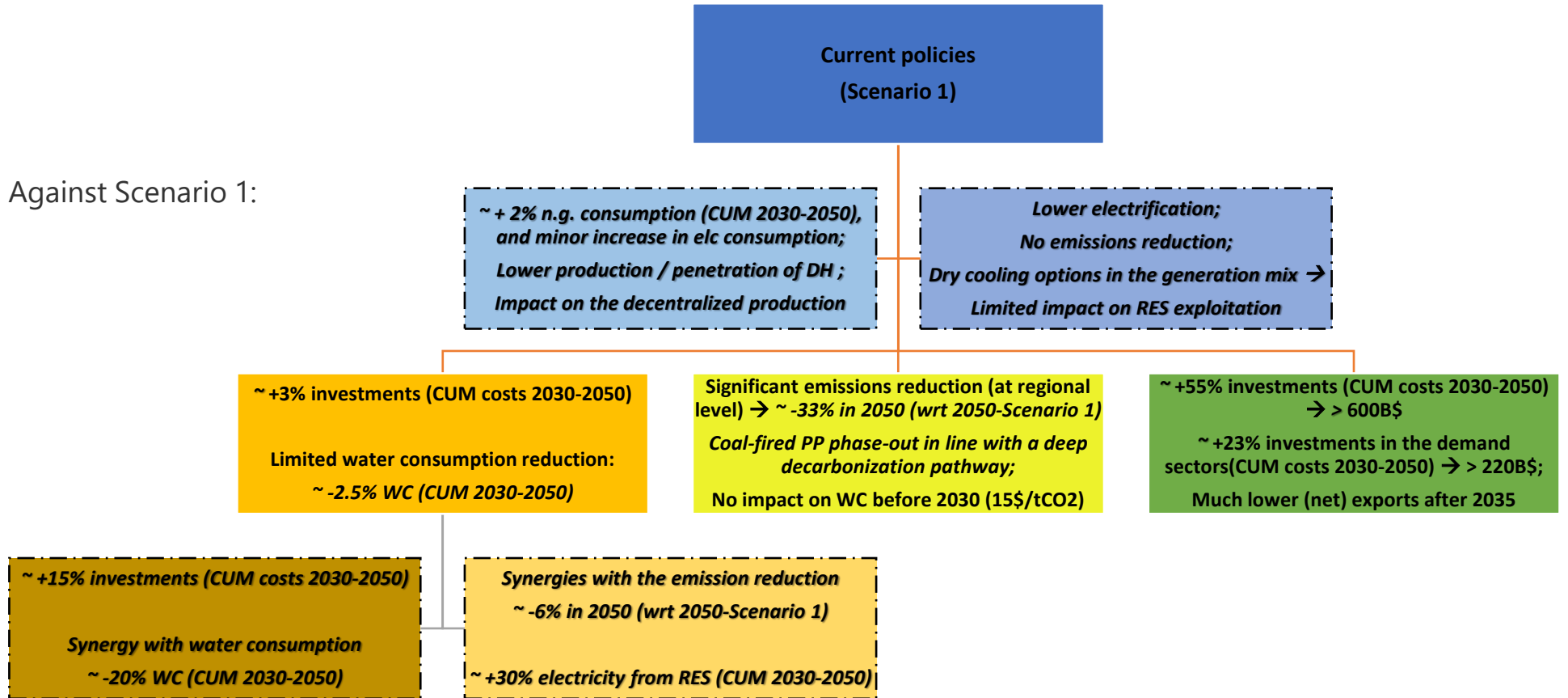


Second scenario tree



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Against Scenario 1:



More information can be found in the dashboard!





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Stakeholder discussion

Rocco De Miglio (E4SMA srl)

Gabriele Cassetti (E4SMA srl)

Open discussion format

Objective

- Open discussion to share recommendations, knowledge, and experiences, to raise questions, and to support the further development of the analyses

One group

- Forum → All
- Key policies and measures → All
- Key data assumptions/uncertainties → All

How?Introduction
(forum)Discussion / collection of comments and
suggestions (group)

45 min



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Home Search in Energy & Climate in the Central Asia Caspian region...

US

Post Question Discussion

US What's on your mind?

Photo/Video File

Main feed Add Topics Post

Emissions (MtCO₂e) / GDP (billion USD) Investment Costs - Lumpsum per person (billion USD) / Oil - gas - N2 net export (Mio
Welcome to the CAC community
 Energy and Climate in the Central Asia Caspian
 Data, policies & measures, models, dashboards, and a
 knowledge-sharing environment
 Check out our latest workshop note

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 Gabriele Cassetti 2
 Rocco De Miglio 2


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1 member



Kyrgyzstan
1 member


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Gabriele Cassetti
2



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Azerbaijan 2 members

Turkmenistan 2 members

Tajikistan 1 member

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Contents (posts, questions, discussions) are only visible to group members

All Groups > Uzbekistan

Uzbekistan 2 members 0 questions 0 posts

Post Question Discussion

What's on your mind?

Photo/Video File

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No items available at this time.

Members (2)

Add members to group

- Gabriele Cassetti Forum administrator - Energy System Modeller and Analyst
- Rocco De Miglio Forum Administrator - Energy System Modeller and Analyst

Show all members




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Kazakhstan
2 members



Uzbekistan
2 members



Azerbaijan
2 members

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- Ask a question
- Answer a question

To join groups it is necessary to make a request



Turkmenistan
2 members

All Groups > Kazakhstan

Kazakhstan 2 members 0 questions 1 post

This is a private group.

Please request to join to see the content.

Request to Join

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Gabriele Cassetti
Forum administrator - Energy System Modeller and Analyst
Posted 4 days ago

Fossil fuel price assumptions included in TIMES-CAC

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Gabriele Cassetti 2		
Rocco De Miglio 2		

Feature Request

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Gabriele Cassetti   [Edit Profile](#)

12 Forum administrator - Energy System Modeller and Analyst
15 seconds ago

I support the development of TIMES CAC (Central Asia and Caspian) model and the engagement of local stakeholders in long term energy scenarios co-design.

Posts 1 | Questions 0 | Answers 0 | Discussions 0 | Replies 0

Groups 4

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Post - Workshops

Gabriele Cassetti · Forum administrator - Energy System Modeller and Analyst
Posted 4 days ago

Fossil fuel price assumptions included in TIMES-CAC

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Email & Notifications

General

Receive email notifications

Automatically follow anything I participate in

On topics I'm following, send updates for Only New Posts (Default)

Frequency

New activity in topics I'm following Daily (Default)

Posts I'm @mentioned in Immediately (Default)

New activity in specific posts I'm following Immediately (Default)

Upvotes and likes on my posts Immediately (Default)

New activity from people I'm following Daily (Default)

New followers Immediately (Default)

Notification from groups I have joined Immediately (Default)

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Conclusions

Rocco De Miglio (E4SMA srl)

Gabriele Cassetti (E4SMA srl)

III
workshop

Bilateral follow-up
dialogues
(E4SMA sharing
workshop material with
local stakeholders)

FORUM (<https://cac.tribe.so/>)

Country experts and stakeholders provide feedback (comments, recommended policy elements and data sources, questions,...).

Platform to dialogue in view of the upcoming **COP26**





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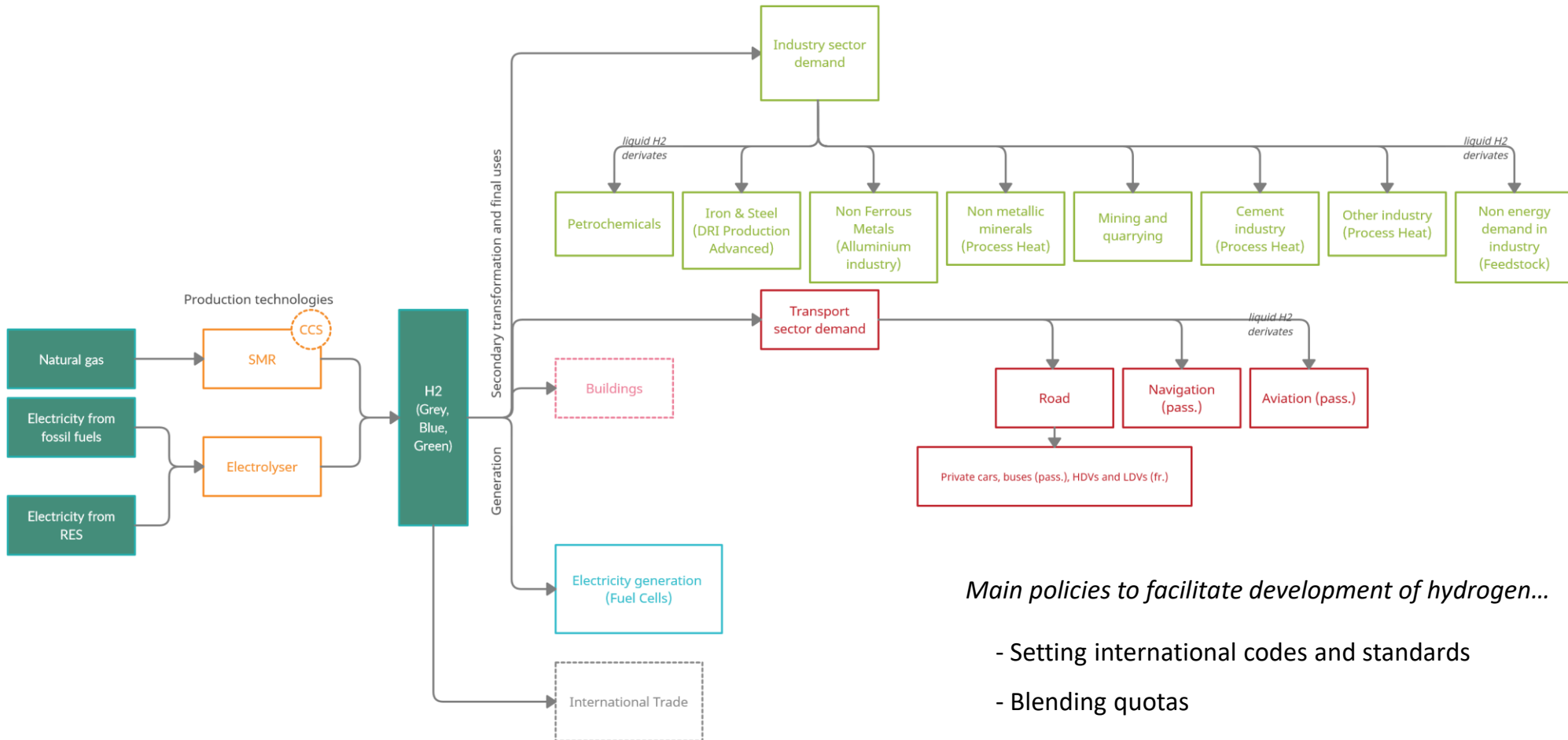
TIMES-CAC

(Azerbaijan, Kazakhstan, Turkmenistan, Uzbekistan)



- BaseYear: 2017- Horizon: until 2050 (2017, 2018, 2020, 2025, 2030, 2035, 2040, 2045, 2050)
- Built based on “bottom-up reconstructed” National Energy Balances
- (Intra-annual) timeslots: up to 24 slices as a first proposal (4 seasons * 6 intraday slots)
- Sectors: mining/upstream; secondary transformation and generation, demand sectors (residential, tertiary, industry, agriculture, transport)
- High level of technology/activity explicitness (supply and demand side)
- Trades with RoW (particular attention to the trades with Kyrgyzstan and Tajikistan)
- Emissions coverage: GHGs (Fuel combustion activities A1-A4, Fugitive emissions from fuels)
- Dynamic Partial Equilibrium model formulated in MILP





Main policies to facilitate development of hydrogen...

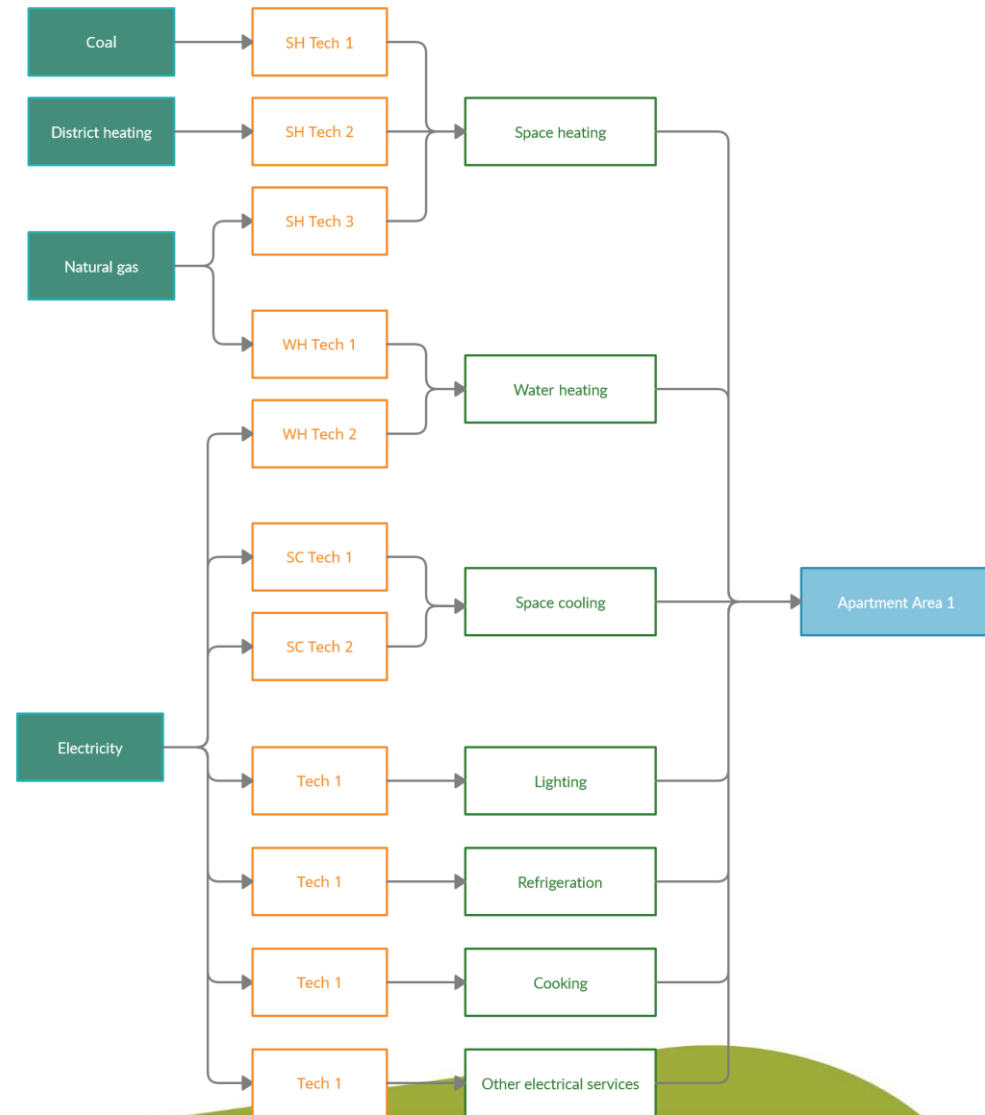
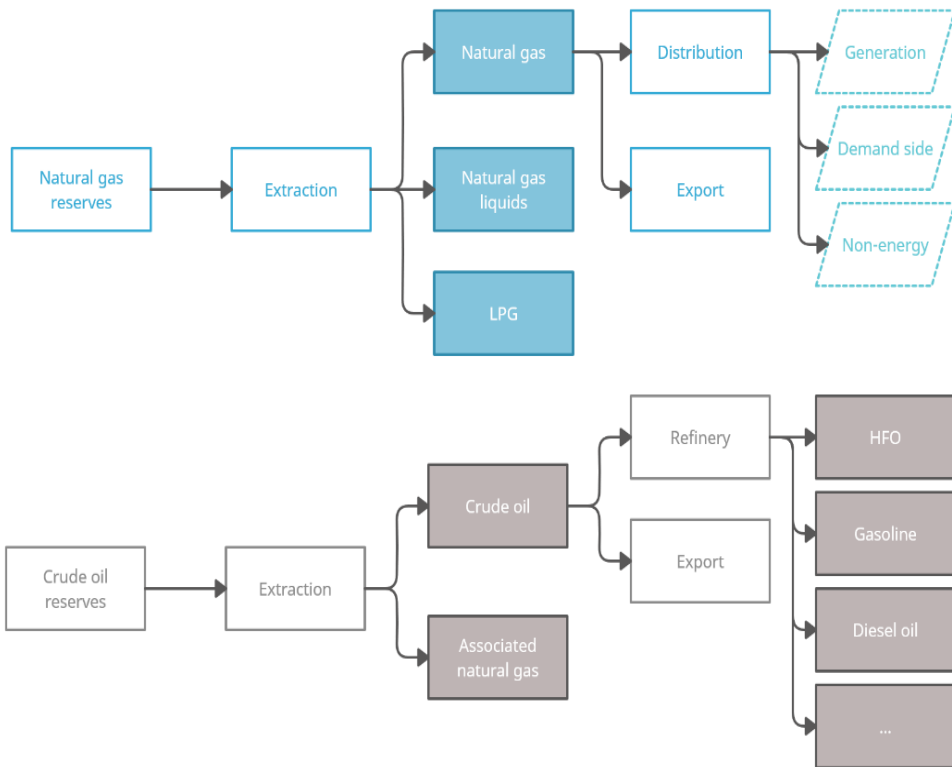
- Setting international codes and standards
- Blending quotas
- Green hydrogen premium

...and barriers

- Regulatory and legal/missing legislation

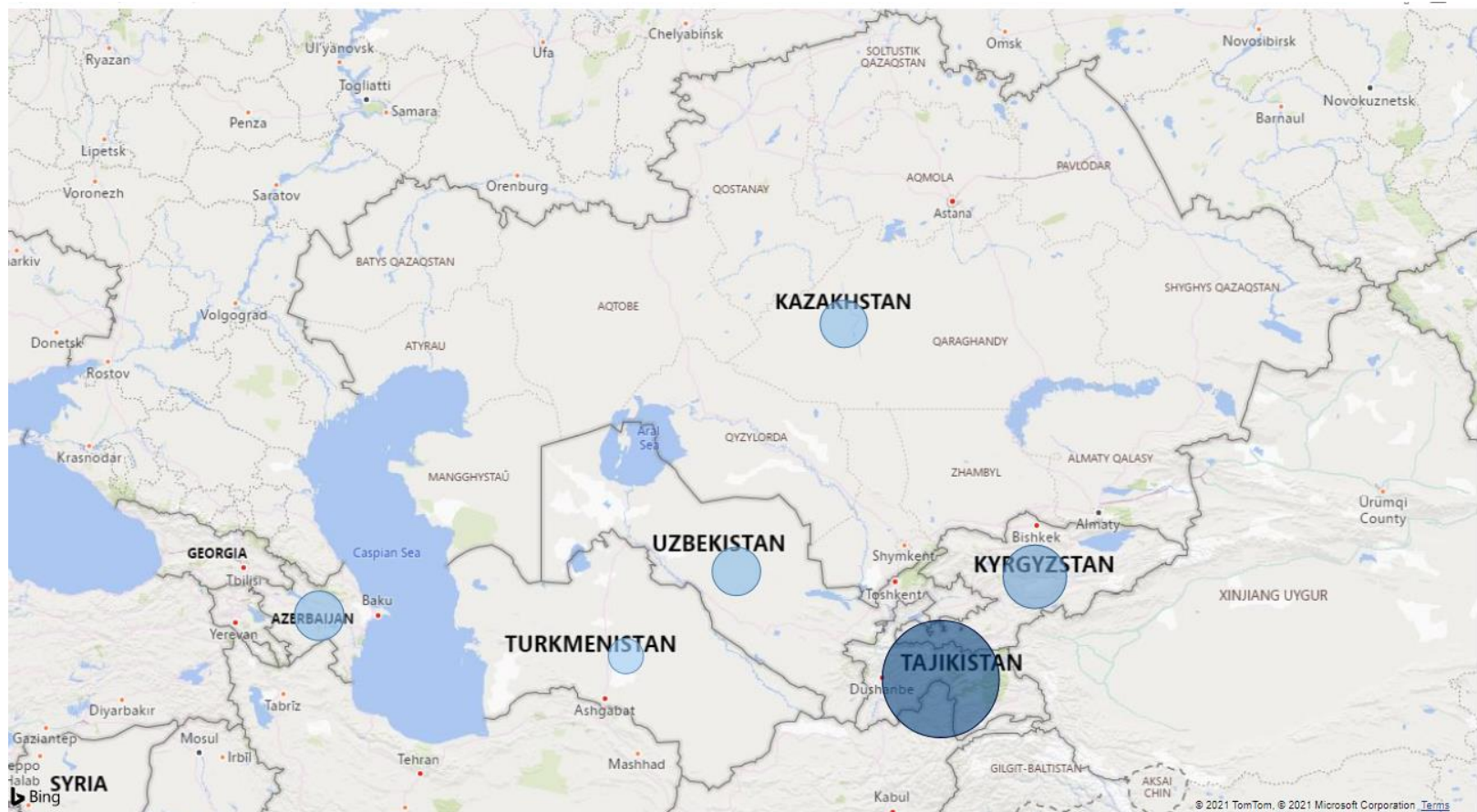


Upstream and building sector in the TIMES-CAC



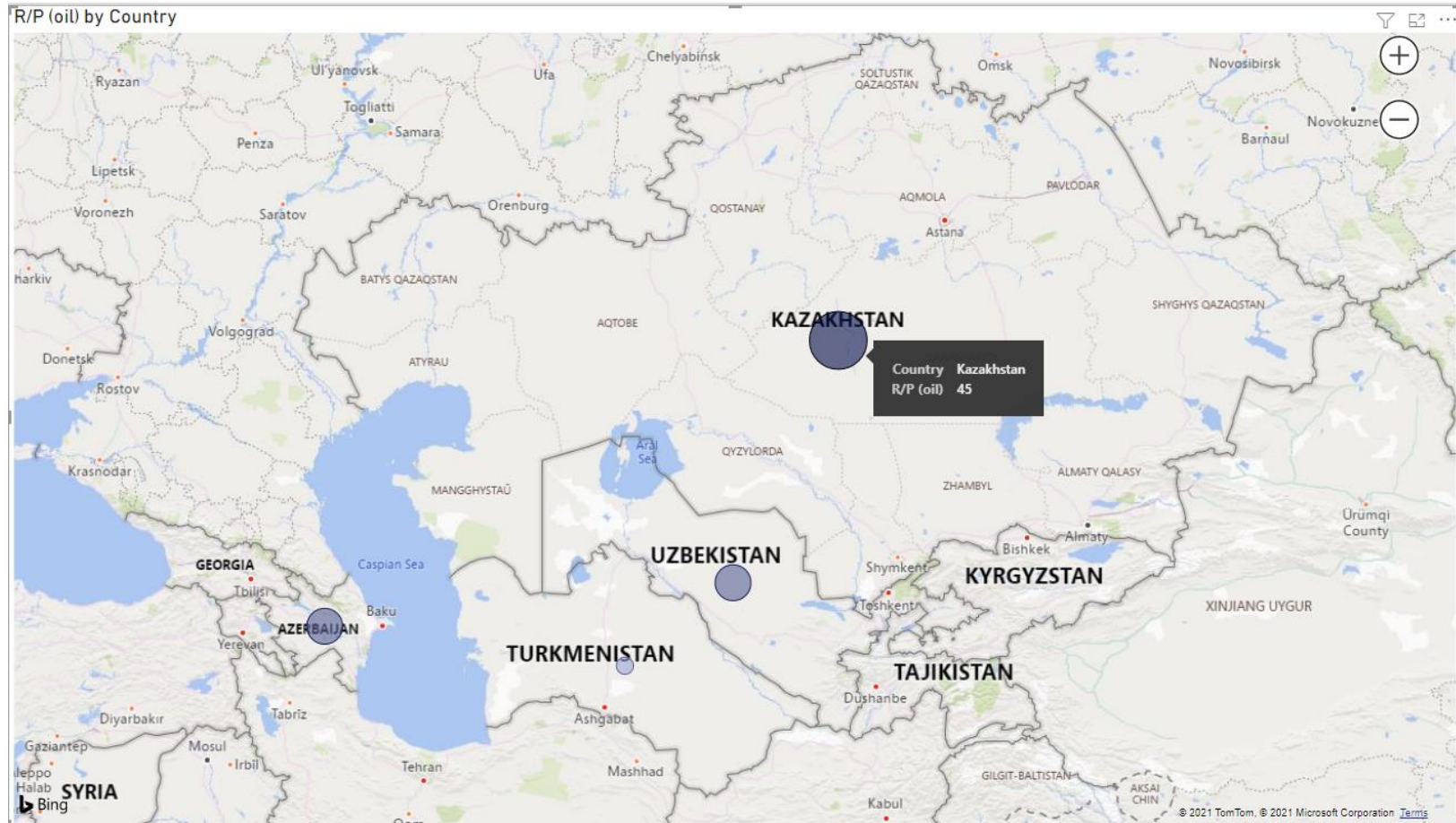
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Main river basins and hydropower potential



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Stakeholder engagement: what for?



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