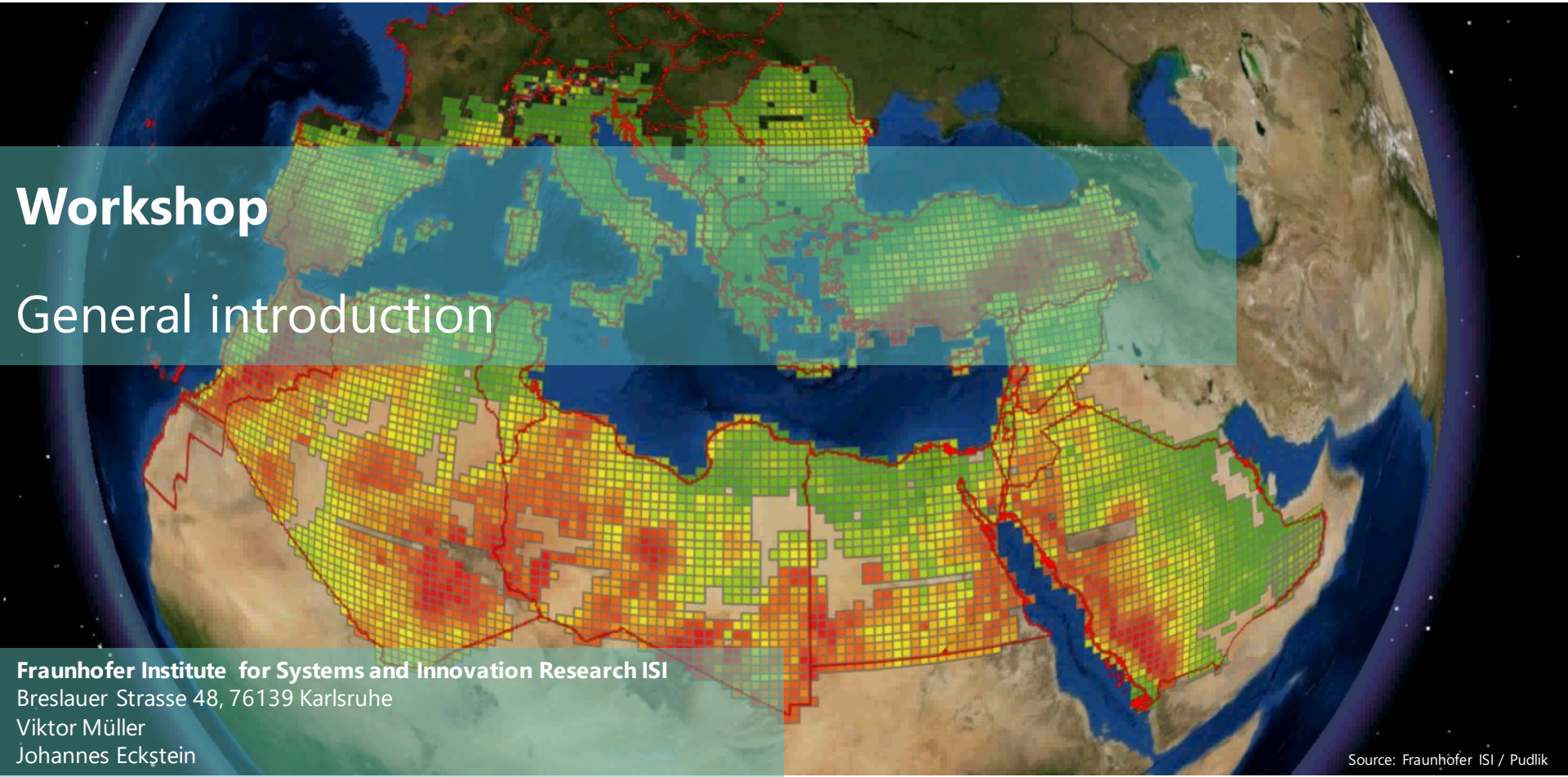


LEAP USER GROUP WORKSHOP AS PART OF THE REGIONAL EXCHANGE OF MODELLING EXPERTS IN THE WB6



Fraunhofer Institute for Systems and Innovation Research ISI
Breslauer Strasse 48, 76139 Karlsruhe
Viktor Müller
Johannes Eckstein

Source: Fraunhofer ISI / Pudlik

BUSINESS UNIT: CLIMATE POLICY

- Questions regarding climate policy developments (part. gas markets, hydrogen) and innovation support policies (EU Innovation Fund, CCfDs)
- Questions related to emission trading systems (EU and other ETS)
- Climate change mitigation strategies and their assessment

- **Johannes Eckstein** is senior researcher in the business unit Climate Policy in the Competence Center Energy Policy and Energy Markets
- Work focus:
 - energy and climate policy development and evaluation
 - focus on industrial applications and policies
 - scenario-based energy system modelling



BUSINESS UNIT: GLOBAL SUSTAINABLE ENERGY TRANSITIONS

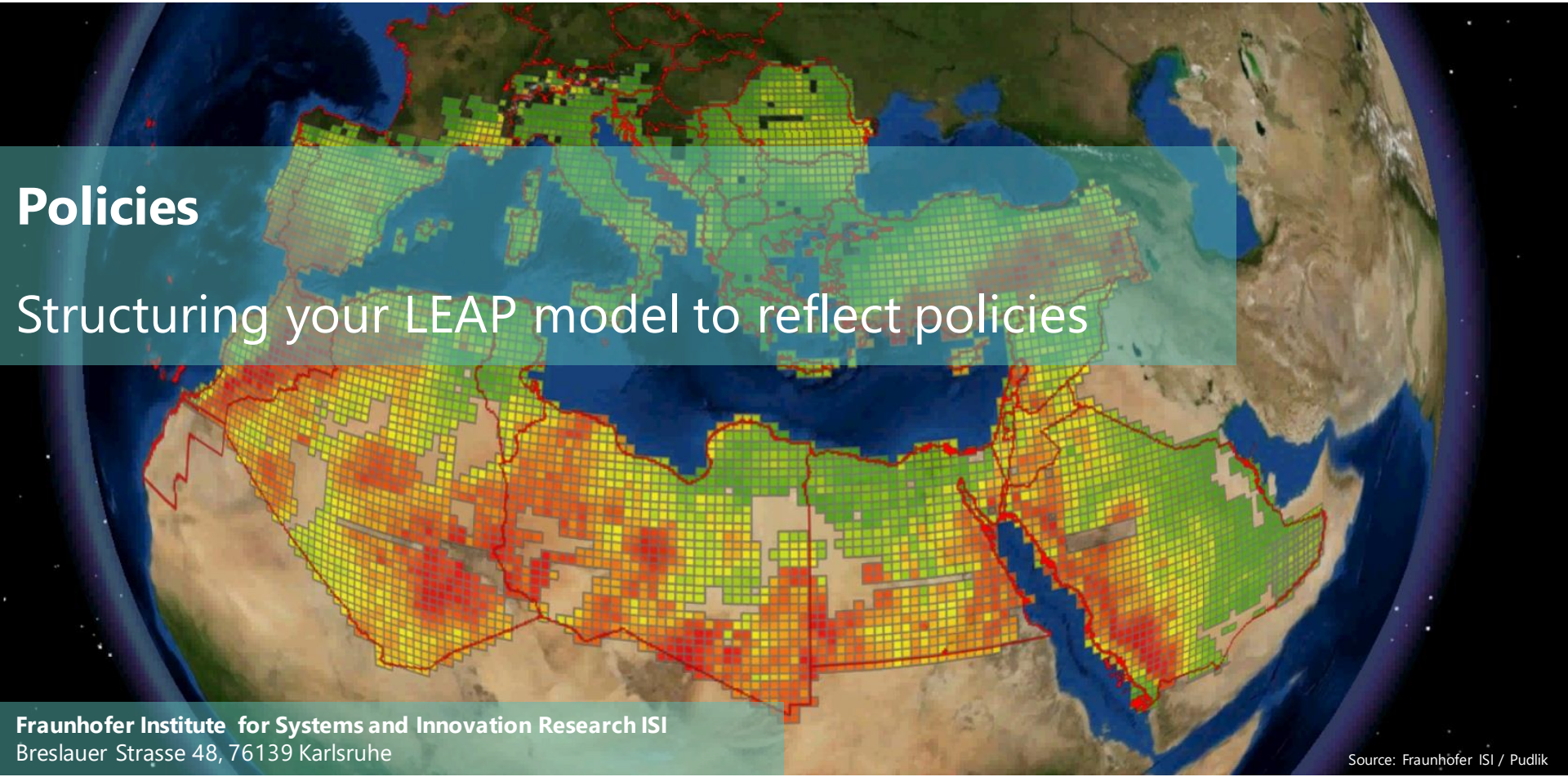
- **Support of planning and implementation of sustainable energy and development strategies in emerging and developing countries.**
 - assessment of potentials and possible diffusion pathways for renewable energy technologies
 - model-based analyses of energy systems
 - evaluation of local value creation potentials for energy technologies
 - development of policy instruments and strategies supporting sustainable energy transitions.

- **Viktor Müller** is junior researcher in the business unit Global Sustainable Energy Transitions in the Competence Center Energy Policy and Energy Markets

- Work focus:
 - promotion strategies for renewables energies
 - hydrogen technologies and synthetic fuels
 - modelling of energy systems



LEAP USER GROUP WORKSHOP AS PART OF THE REGIONAL EXCHANGE OF MODELLING EXPERTS IN THE WB6



Policies

Structuring your LEAP model to reflect policies

Fraunhofer Institute for Systems and Innovation Research ISI
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Source: Fraunhofer ISI / Pudlik

STRUCTURING YOUR LEAP MODEL TO REFLECT POLICIES

- How are separate policies reflected in your model currently?
- How to use the functionalities of LEAP to set up policy specific scenarios
- Towards a readable and clearly programmed model!

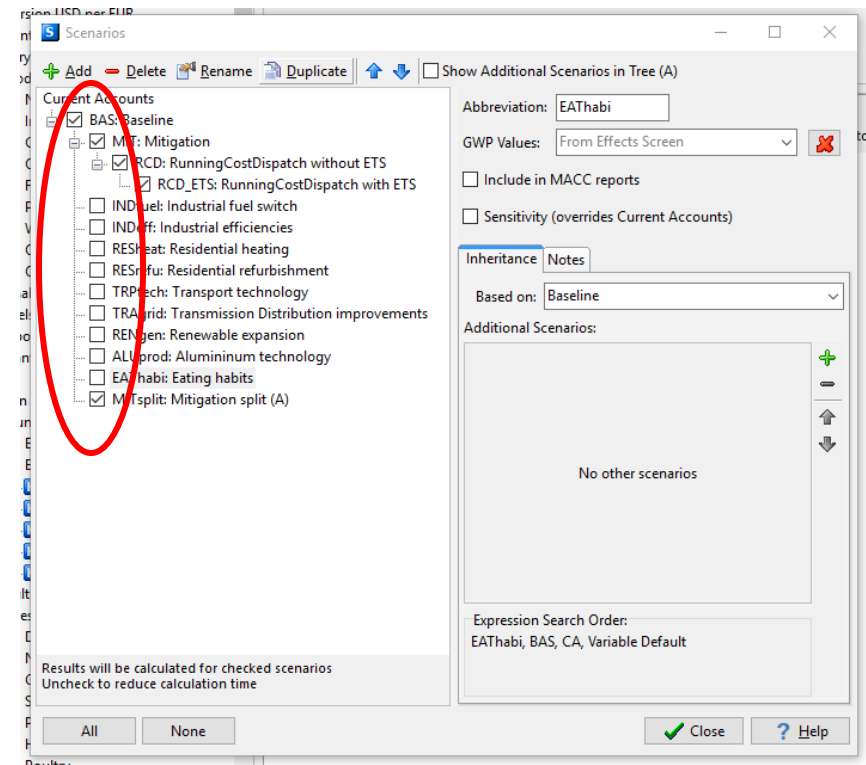
POLICIES AND SCENARIOS

- An "easy option" is to implement all policies in one scenario
 - But what is the effect of single policy?
 - Effect in terms of emissions, energy use, etc
 - LEAP provides a functionality to disaggregate policies

- And there are very good technical reasons to do so!
 - improves readability of the code
 - improves maintenance
 - helps during model development

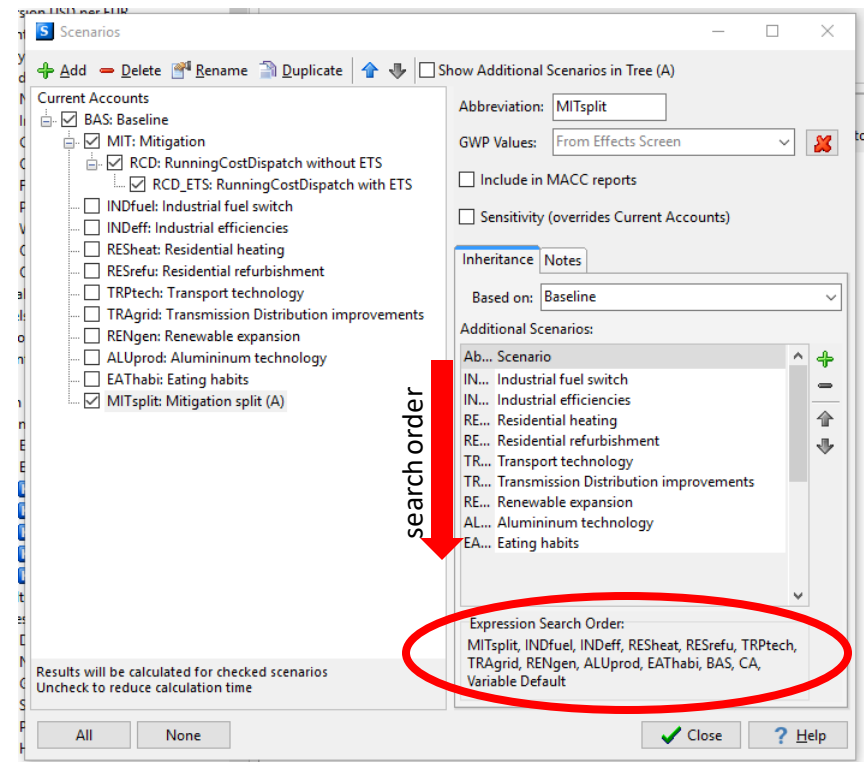
POLICIES AND SCENARIOS

- Good practice:
 - put each policy into one scenario
 - set up a meaningful inheritance in the scenario view
 - only tick those you are interested in for results
 - each scenario ticked for results increases calculation time



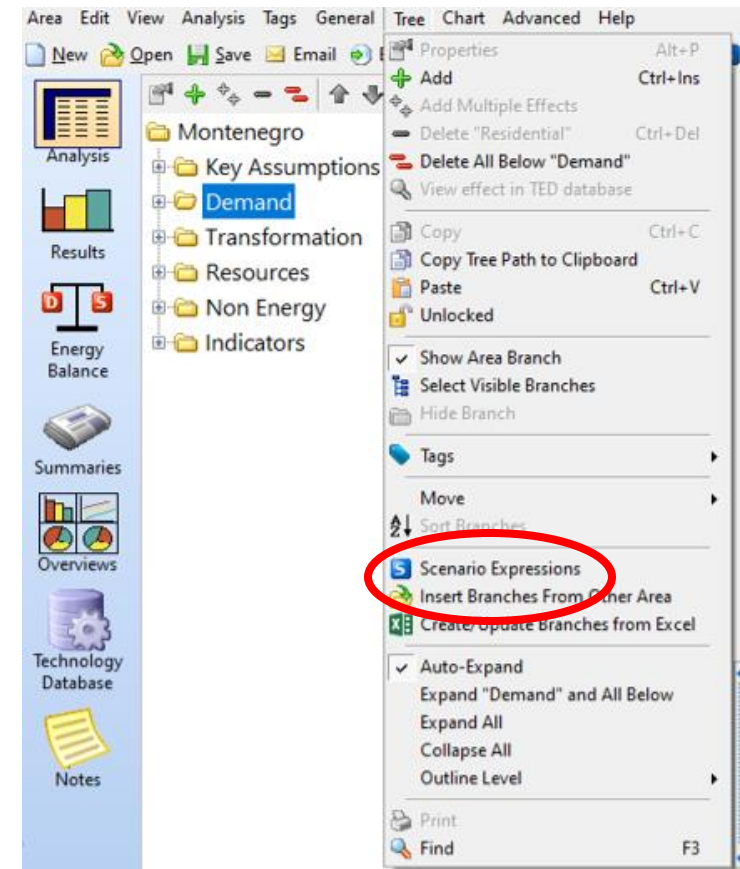
POLICIES AND SCENARIOS

- Watch out
 - check the expression search order to double check
 - LEAP reads the inheritance list from top to bottom to find expressions in each branch
- If two scenarios act on the same variable, you need to manually create a combination!



POLICIES AND SCENARIOS

- Scenario expressions
 - Provides an overview of all expressions associated with the scenario
 - Might get confusing if too many expressions are bundled in one scenario
- Put different policies in different scenarios



POLICIES AND SCENARIOS

- All policies in one scenario
- Many expressions and rather bad readability

- Policies clustered by topic and bundled in one meaningfully named scenario
- Less expressions and better readability

Scenario Expressions

Scenario: Mitigation Variable: <All Variables> Branch Labels: Truncated Find: Go to Expression Delete Duplicates

Branch/Variable	Scenario Expression	Duplicate?
DMD\Industry\Chemical\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Industry\Food\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Industry\Iron Steel\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Industry\Iron Steel\Coal Lignite\Fuel Share	InterpFSY(2025;Value(2018);2030;0)	<input type="checkbox"/>
DMD\Industry\Iron Steel\Natural Gas\Fuel Share	InterpFSY(2025;Value(2018);2030;5)	<input type="checkbox"/>
DMD\Industry\Non Ferrous Metals\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Industry\Ore Extraction\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Industry\Ore Extraction\Diesel\Fuel Share	InterpFSY(2023;Value(2018);2030;70;2050;50)	<input type="checkbox"/>
DMD\Industry\Other Engineering Metals\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Industry\Other\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Industry\Other\Diesel\Fuel Share	InterpFSY(2023;Value(LastHistoricalYear);2030;50;2050;40)	<input type="checkbox"/>
DMD\Industry\Other\Residual Fuel Oil\Fuel Share	InterpFSY(2023;Value(LastHistoricalYear);2030;0)	<input type="checkbox"/>
DMD\Industry\Paper Printing\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Industry\Wood\Final Energy Intensity	Growth(Key)\constants\MIT industry eff gain[none]	<input type="checkbox"/>
DMD\Residential\Space Heating\Final Energy Intensity	InterpFSY(2022;Value(LastHistoricalYear);2050;Value(LastHistoricalYe...	<input type="checkbox"/>
DMD\Residential\Space Heating)\Coal Lignite\Fuel Share	InterpFSY(2023;0)	<input type="checkbox"/>
DMD\Residential\Space Heating)\Wood\Fuel Share	InterpFSY(2023;Value(LastHistoricalYear);2030;50;2050;25)	<input type="checkbox"/>
DMD\Transport\Freight\Diesel\Fuel Share	InterpFSY(2030;Value(2018)*0,8;2050;Value(2018)*0,7)	<input type="checkbox"/>
DMD\Transport\Passenger\CNG\Fuel Share	InterpFSY(2030;Value(2018)*0,5;2050;Value(2018)*0,2)	<input type="checkbox"/>
DMD\Transport\Passenger\Diesel\Fuel Share	InterpFSY(2030;Value(2018)*0,5;2050;Value(2018)*0,2)	<input type="checkbox"/>
DMD\Transport\Passenger\Gasoline\Fuel Share	InterpFSY(2030;Value(2018)*0,5;2050;Value(2018)*0,2)	<input type="checkbox"/>
KEY\Agriculture\Livestock\Dairy cattle	Growth(-2%)	<input type="checkbox"/>
KEY\IPPU\Aluminium\Emissions PFC\AEM	Value(AEM)\AE-Mins / cell-day; 2018) * Interp(2018; 1; 2025; 0,5)	<input type="checkbox"/>
TRN\Electricity Production\...HPP Komarnica:Exogenous Capacity	Step(2028; 171,9)	<input type="checkbox"/>
TRN\Electricity Production\...HPP Moraca:Exogenous Capacity	Step(2030; 293,6)	<input type="checkbox"/>

Parent Scenario: Baseline Parent Expression: Growth(Key)\constants\BAS industry eff gain[none] Duplicate of Parent?

Double-click in table to go to the expression in Analysis View

Close Help

Scenario Expressions

Scenario: Industrial fuel switch Variable: <All Variables> Branch Labels: Truncated Find: Go to Expression Delete Duplicates

Branch/Variable	Scenario Expression	Duplicate?
DMD\Industry\Iron Steel\Coal Lignite\Fuel Share	InterpFSY(2025;Value(2018);2030;0)	<input type="checkbox"/>
DMD\Industry\Iron Steel\Natural Gas\Fuel Share	InterpFSY(2025;Value(2018);2030;5)	<input type="checkbox"/>
DMD\Industry\Ore Extraction\Diesel\Fuel Share	InterpFSY(2023;Value(2018);2030;70;2050;50)	<input type="checkbox"/>
DMD\Industry\Other\Diesel\Fuel Share	InterpFSY(2023;Value(LastHistoricalYear);2030;50;2050;40)	<input type="checkbox"/>
DMD\Industry\Other\Residual Fuel Oil\Fuel Share	InterpFSY(2023;Value(LastHistoricalYear);2030;0)	<input type="checkbox"/>

Parent Scenario: Baseline Parent Expression: Key\Industry\Fuels\Iron Steel\Lignite Duplicate of Parent?

Double-click in table to go to the expression in Analysis View

Close Help

HANDS ON LEAP

LET'S GO TO LEAP

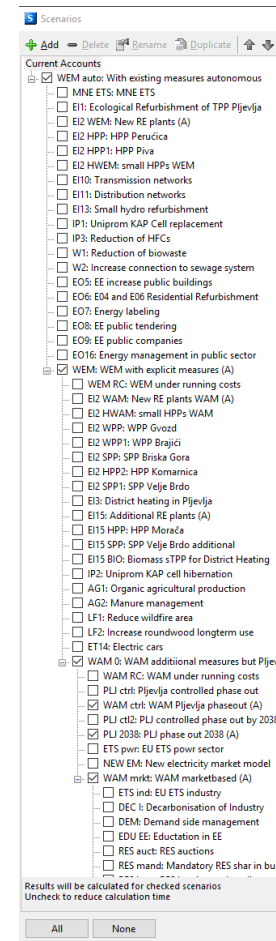
Source: LEAP Handbook

POLICIES AND SCENARIOS

➔ LET'S TAKE A LOOK INTO
THE NECP MODEL!



- The NECP model uses many scenarios
- Grouped to build WEM and WAM scenarios



POLICIES AND SCENARIOS

Questions, comments?

Your own experience?

How to make use of the fact you are all

- *working with the same tool*
- *in similar projects ?*



Does everything need to be developed again and again in each CP?