CAPRI-Training Session 2005

Exogenous projections (the reference run)

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Program

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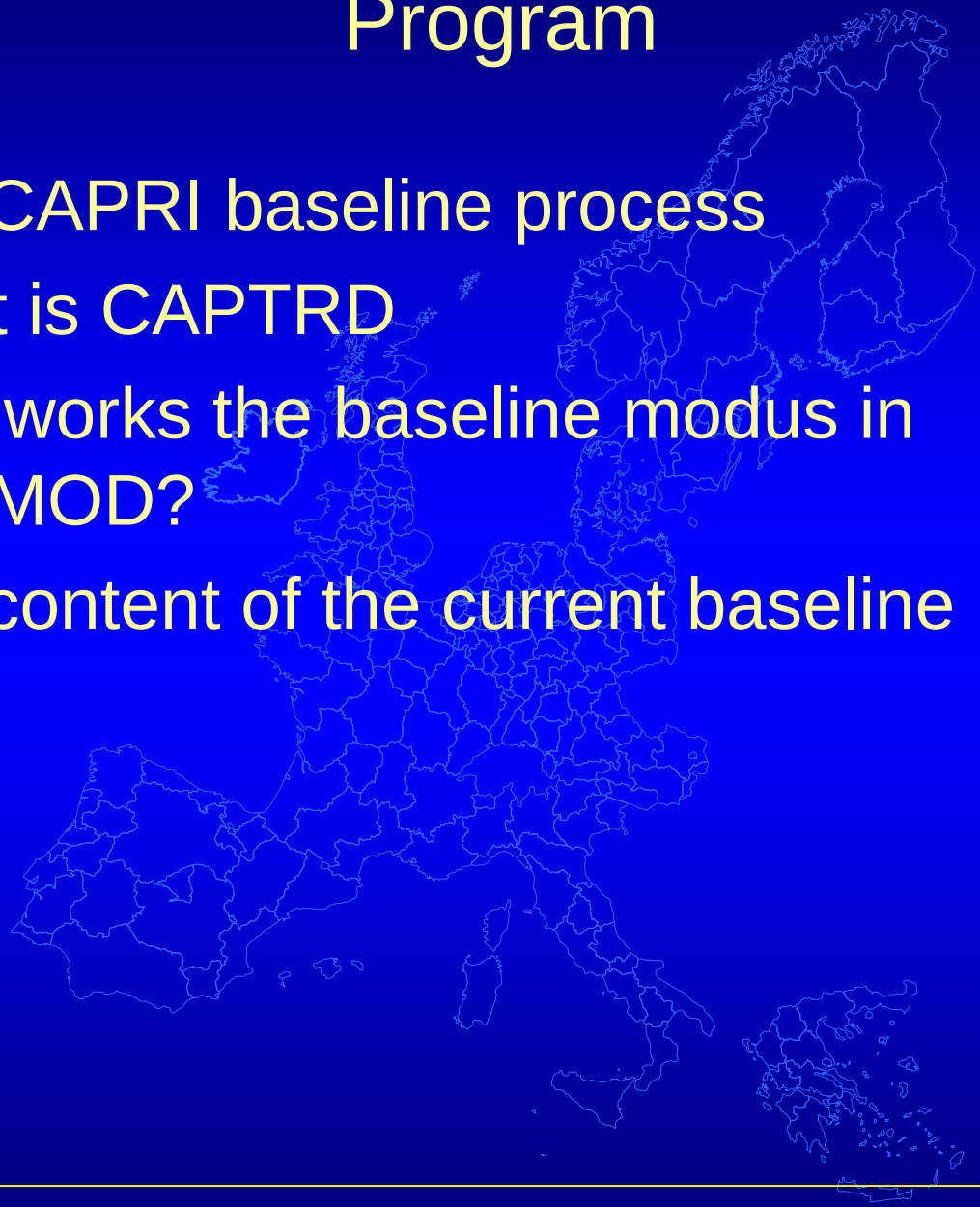
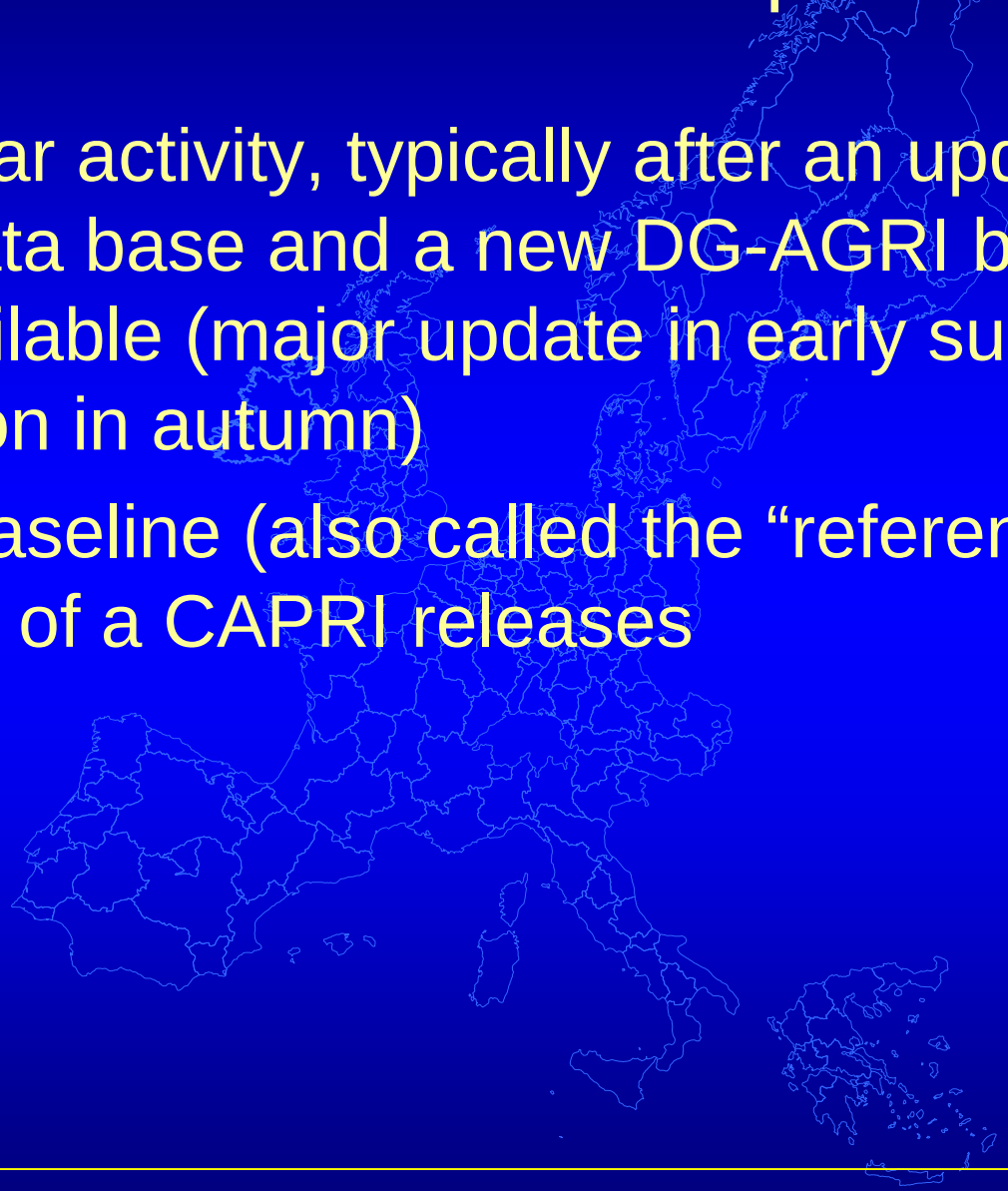
4. The content of the current baseline



The CAPRI baseline process

- Regular activity, typically after an update of the data base and a new DG-AGRI baseline is available (major update in early summer, revision in autumn)
- The baseline (also called the “reference run”) is part of a CAPRI releases



Why do we need a baseline modus?

- The baseline is the yardstick for further scenario analysis ó central for the model
- Especially important where absolute values (or absolute changes) are analyzed rather than relative ones.
- Examples of such crucial absolute values:
  - **EU market prices** determine how costly certain policy instruments are (best example: market interventions) and thus determine the size of pro and cons of alternative policies
  - **Applied tariffs** by the EU based on flexible levies and fill rates of TRQs determine how the model reacts in trade liberalization scenarios
  - Agricultural income when compared to the rest of the economy
  - Environmental indicators as e.g. nutrient surpluses or GHG emissions

The optimal approach …

- It would wonderful to let the model on its own project the future, but it is difficult to estimate simultaneously

(1) the effect of changes in the market and policy environment,

(2) the effect of changes in technology and

(3) the effect of changes in behavior

⇒ The parameters in the model are not suited for a endogenous reference run

ó "trends" in parameters are missing which capture the exogenous drivers

What other modelers do …

- GTAP:
  - often comparative-static simulation in the base year ó avoids problem
  - .. But render results less useful for policy impact analysis
- FAPRI:
  - recursive-dynamic baseline
  - mix of projections with the model made from econometrically estimated behavioral equations and expert feedback (so called “melting down” process).
  - Impossible for outsiders to find out what comes from the model, what from the experts and how the two sources interact
- AgLink:
  - recursive-dynamic baseline
  - calibration of individual country modules to external projections provided by OECD member countries
  - then use of linked system to clear markets => prices and quantities will adjust and deviates from the original projections
  - Feedback from member countries to model results => eventual update of external projections
  - Process is repeated until coherence is achieved

What we did until now ...

- Selected use of projection results from FAPRI, FAO and DG-AGRI baselines to project market balances, prices and trade flows worldwide (selection was rather ad-hoc)
- Parameter calibration of market model to these results
- Trends analysis for yields at Member State level, forecast of levels of exogenous crops
- Update of input coefficients, crop nutrient and animal requirements based on trend forecasted yields

What we did until now ...

- Than “normal” simulation:
  - The changes in input and output coefficients together with the price forecasts led to changes in the relative competitiveness compared to the base year, and provoked changes in production and feed use in the supply models
  - However, these changes where not balanced with the results projected for the market model
    - Iterations between supply and market modules
    - Prices and quantities changes
    - In the end, market clearing was achieved, but results (production, demand, prices) differed from original calibration point

How did we evaluate that proceeding

- As the outcome was not in all cases satisfactory:
  - Manual changes to parameters of cost functions/yield trends/market model projections in a direction where increased plausibility was expected
  - Repetition of whole process => new results => new problems => other corrections

=> cumbersome, intransparent, path dependent

What we are trying to do now …

- Mutually consistent ex-ante calibration of supply and market modules
  - close to AGLink process
  - uses in parts infrastructure already comprised in CAPREG (feed distribution algorithm, revised first stage PMP)
- “Intelligent” trends in CAPTRD which comprise the effect of policy changes compared to the base year
- Transparent integration of DG-AGRI Baseline

What are the problems of the new approach?

- If both policy and change in yields/areas/herds etc. follow a trend, the policy shift may exaggerate the effect

  <= must be healed by results from external DG-AGRI baseline!

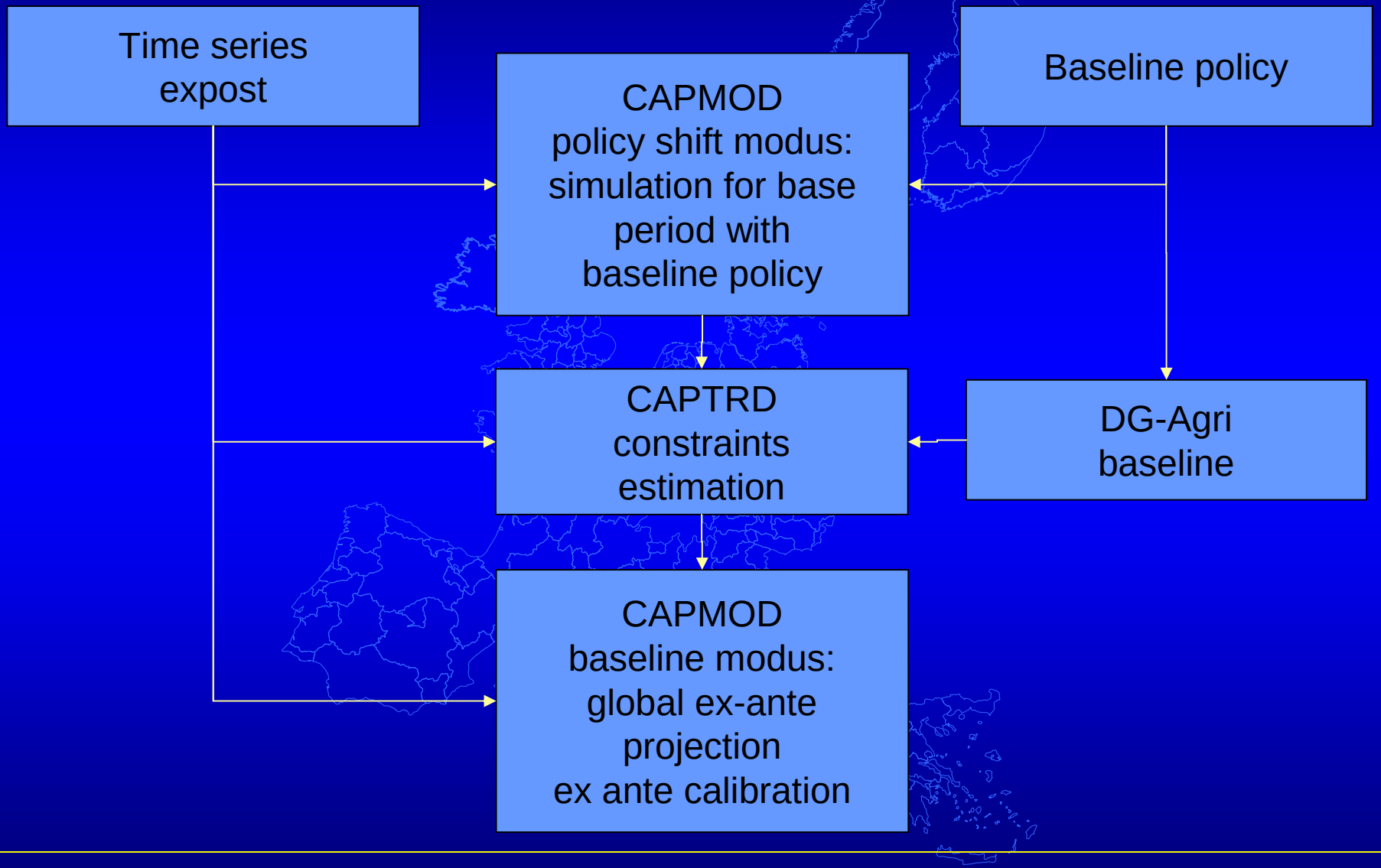
- DG-AGRI baseline is aggregated: regional perspective missing, single Member State results for EU10 solely

  ó certain arbitrariness in allocating DG-AGRI baseline to Member State and regions, however, policy shifts should cover regional/national specific policy effects

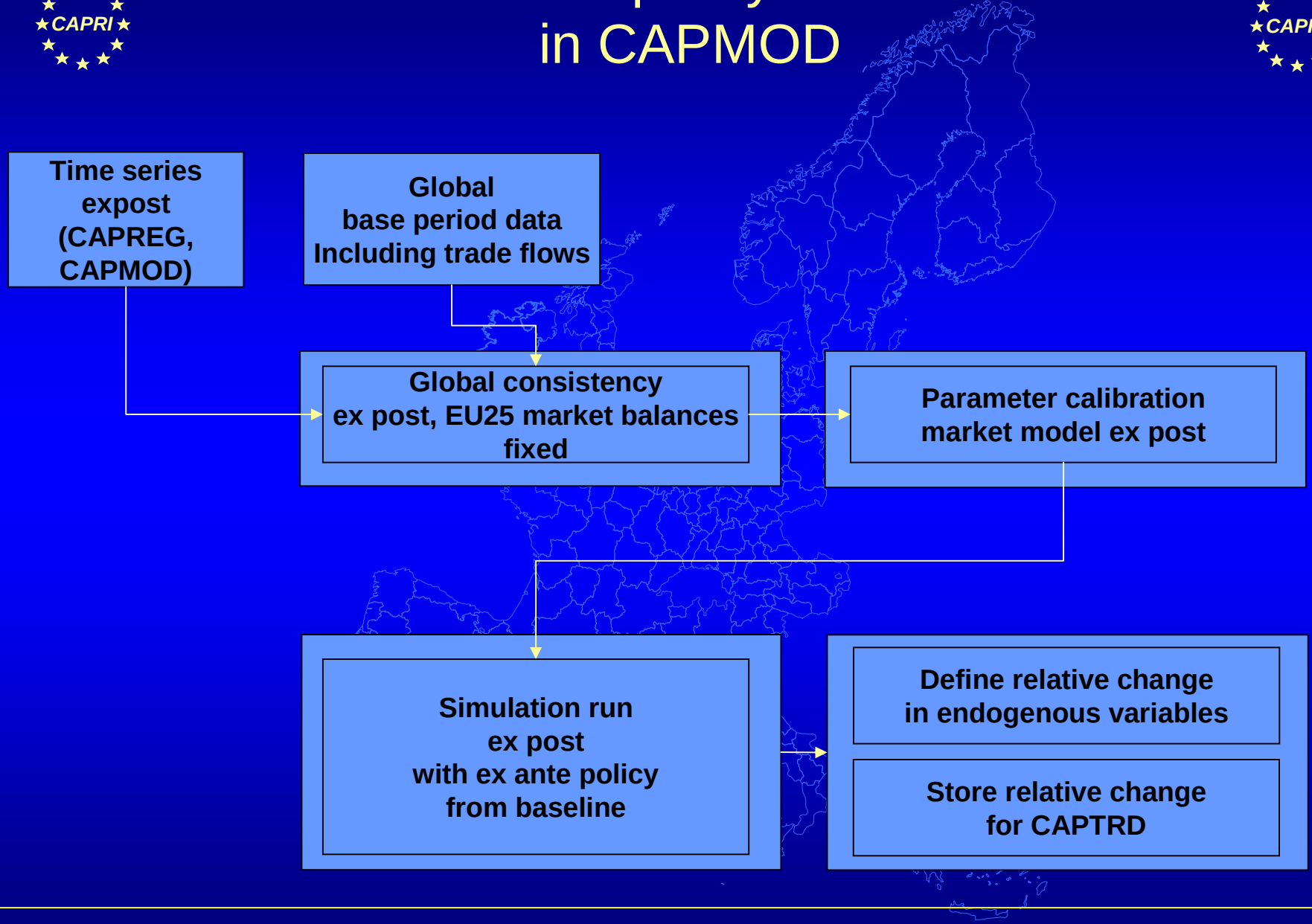
- DG-AGRI does not cover all products and activities

  => larger parts of our reference run are driven by the constrained trends and policy shifts

Overview on CAPRI baseline process



Overview on policy shift modus in CAPMOD



What is CAPTRD?

- GAMS project which estimates trend values for almost all time series comprised in data base (exemption: input coefficients)
- Provides the basis for the baseline (also called “reference run”)
- Integrates information from DG-AGRI baseline
- Ensure that results are mutually compatible based on constrained estimation

CAPTRD I

- CAPTRD covers the following restrictions:
  - Production = activity levels x yields
  - Closed market balances
  - Area balances
  - Young animal balances
  - Fat and protein balances for dairy products
  - Energy and protein balances for animal requirements and deliveries
  - Consumer prices = producer prices plus consumer price margins
  - Consumer expenditures = consumer prices times per capita consumption
  - …

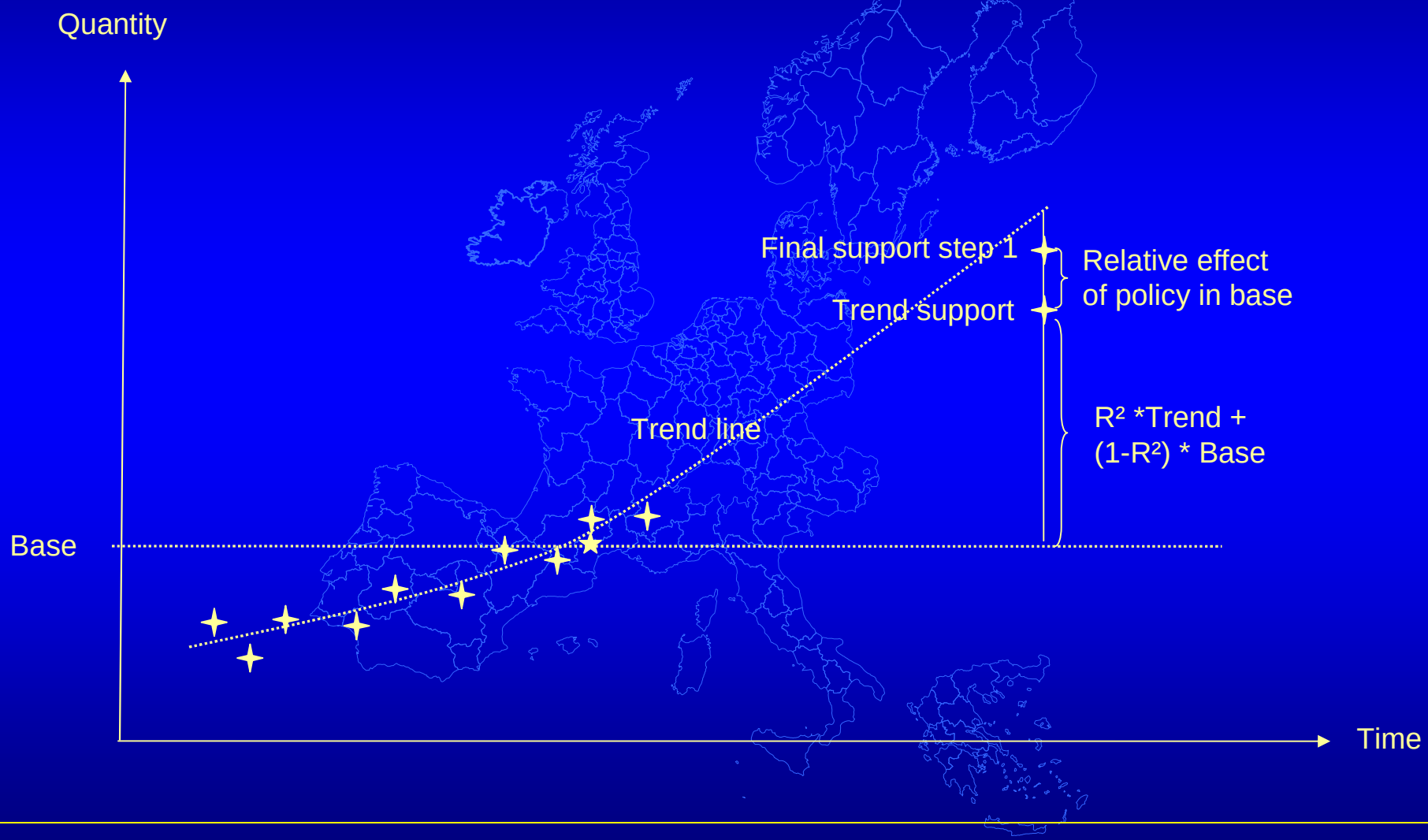
CAPTRD II

- Methodology
  - Estimate trend as (a + b*trend^c)
  - Constrained estimation minimize difference to supports, weighted with variance of error term of unconstrained trend line
  - Supports are:
    $(R^2$*trend estimate + (1-R^2*base year value))*(1+policy_shift)
- Motivation for supports:
  no-change as zero-hypothesis
- Additional framework to estimate levels, yields and production at NUTSII, fixing Member State results

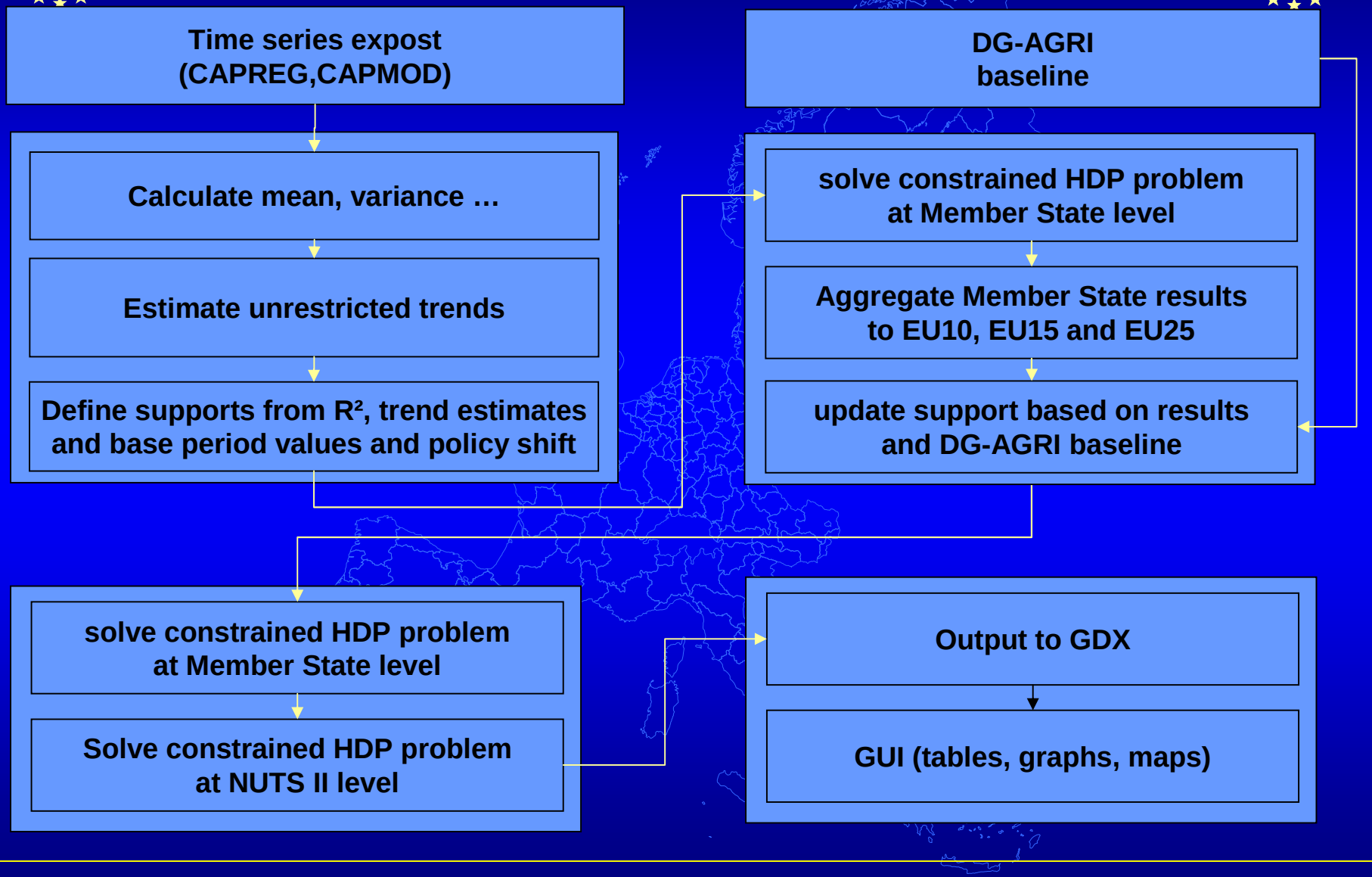
CAPTRD III

- "policy_shift":
  - Relative change of endogenous variables resulting from implementing the baseline policy for the last simulation year in the base year
  - Calculated from an ex-post application of simulation engine CAPMOD with market feedback
  - Thus covers changes in border protection, administrative prices, premiums schemes …
  - … but does not include the effect of technical progress, demand shifts, population growth etc.

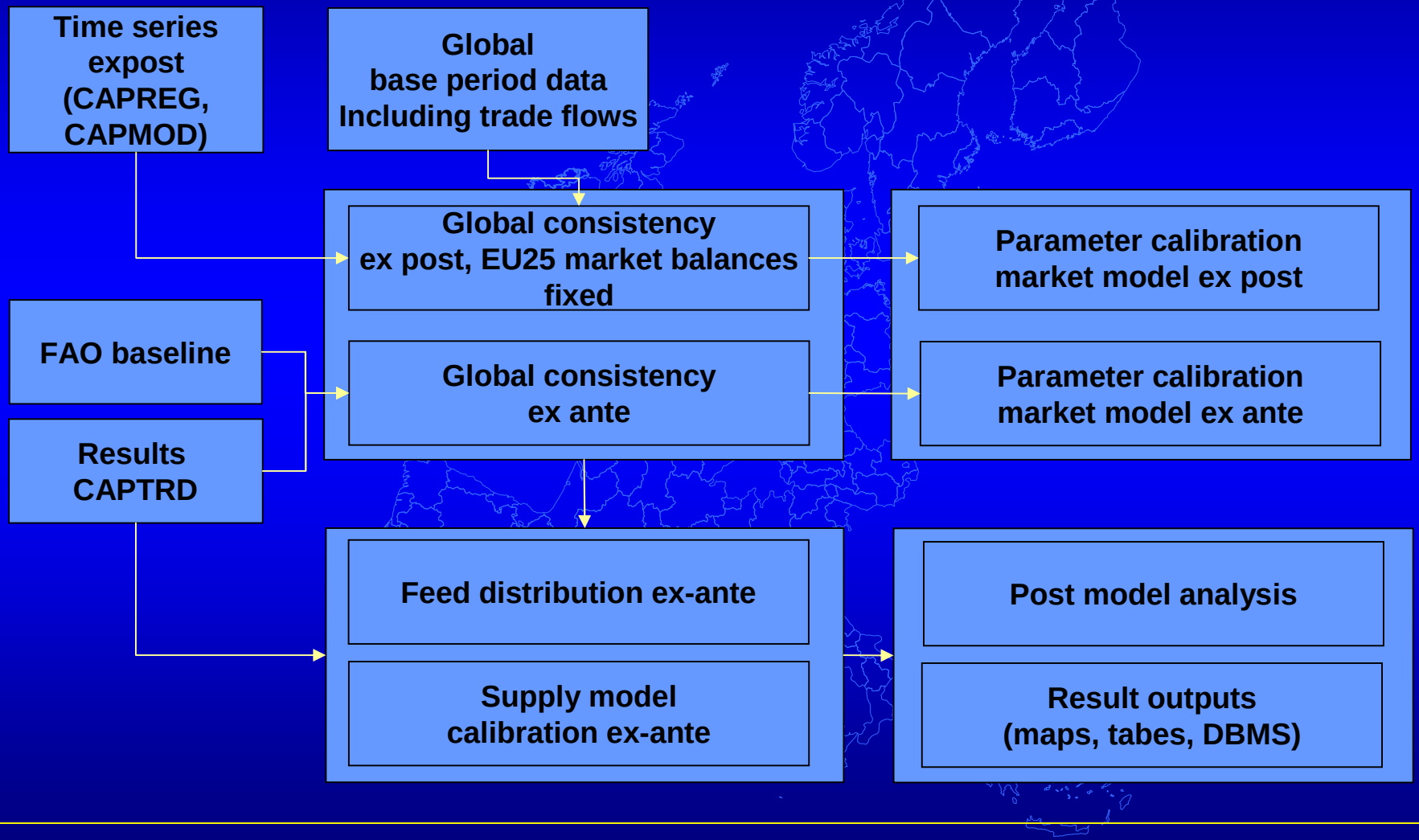
CAPTRD I


Quantity
Final support step 1
Trend support
Relative effect
of policy in base
Trend line
R² *Trend +
(1-R²) * Base
Base
Time

Overview on CAPTRD



Overview on baseline modus in CAPMOD



May I construct my own baseline?

- Yes, by introducing new “supports” in CAPTRD, and re-calibrating the model
- So far, not documented, but technically quite easy.
- But: a common reference run eases the use of the system …