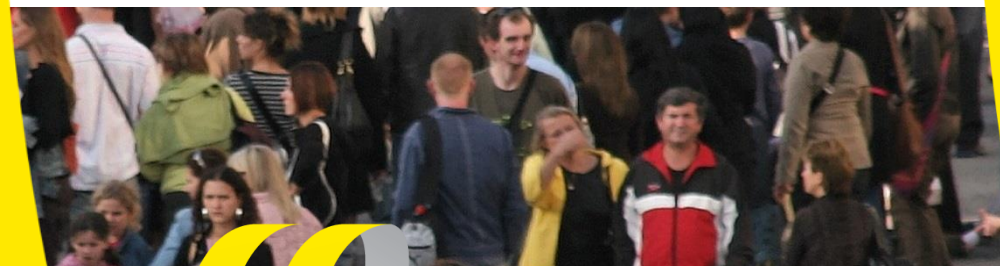




Assessment of Modalities for LDV CO₂ Regulations beyond 2020

Huib van Essen (CE Delft), 9 December 2014



Outline

- Objective of the study
- Scope of the study
- Overview of approach and work packages
- Modalities and conceptual framework
- Overview of the stakeholder Consultation

Objectives of the study

- Overall objective:
To evaluate the possible design options for the regulation of cars and light commercial vehicles (LCV) CO₂ beyond 2020, including:
 - Impacts from different design options
 - Pros and cons of different design options
- Building on all work already performed on this topic
- Complemented by additional assessment where necessary
- Consortium: CE Delft (lead), TNO, Cambridge Econometrics & TML

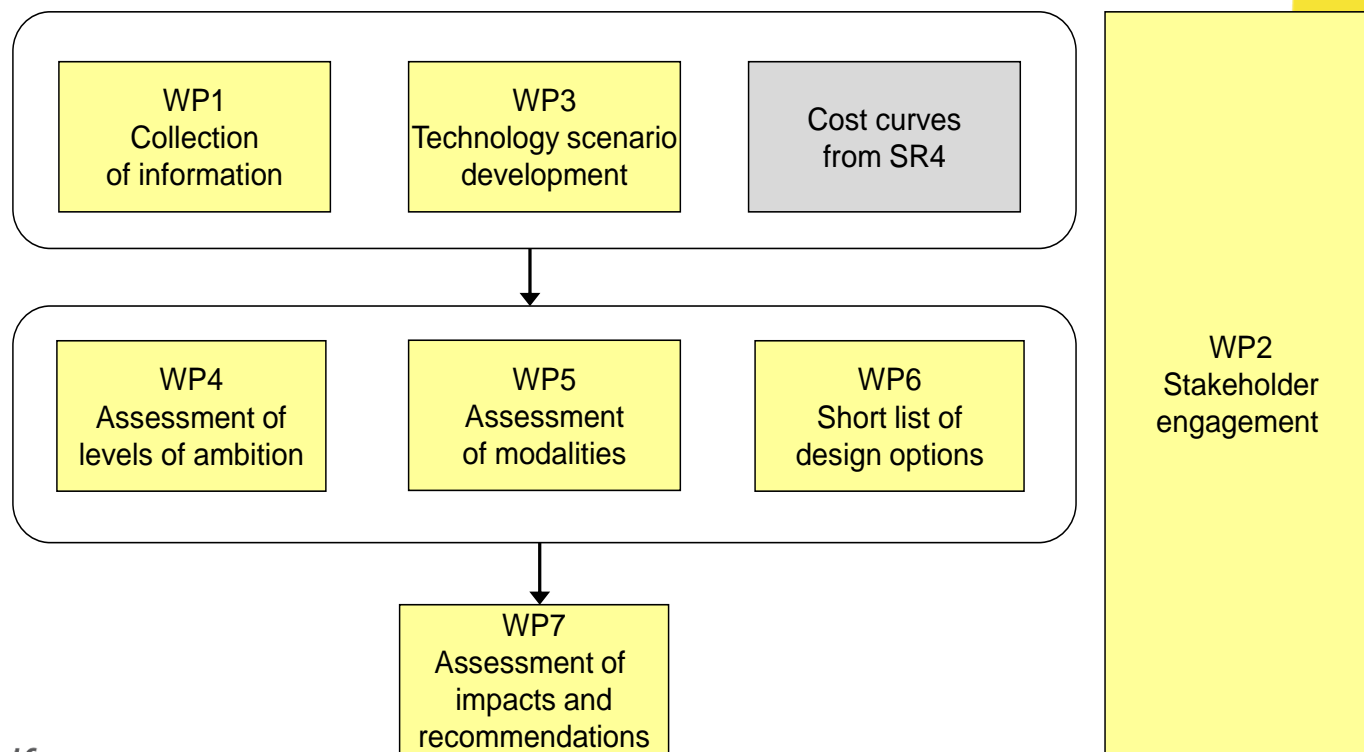
Scope of the study

- **Focus of the study:**
 - Regulation of car and LCV
 - GHG emissions
 - 2025 and 2030 in particular, where possible also 2050
- **Greenfield approach adopted**
 - NOT: existing Regulation as starting point with modifications
 - BUT: starting point are the objectives of the Regulation: broad overview and assessment of design options



Overview of approach and work packages

- Phase 1: Collection & assessment of available information
- Phase 2: Assessment of relevant elements for post 2020 Regulations
- Phase 3: Impact assessment of short list & Recommendations
- Stakeholder consultation throughout entire project



Timeframe of the project

- Project runs from September 2014 till August 2015
- Interdependencies with other on-going studies
- Phase 1: Collection & assessment of available information:
 - September 2014 - February 2015
- Phase 2: Assessment of relevant elements for post 2020 Regulations
 - November 2014 - May 2015
- Phase 3: Assessment of short list & Recommendations
 - May 2015 - July 2015

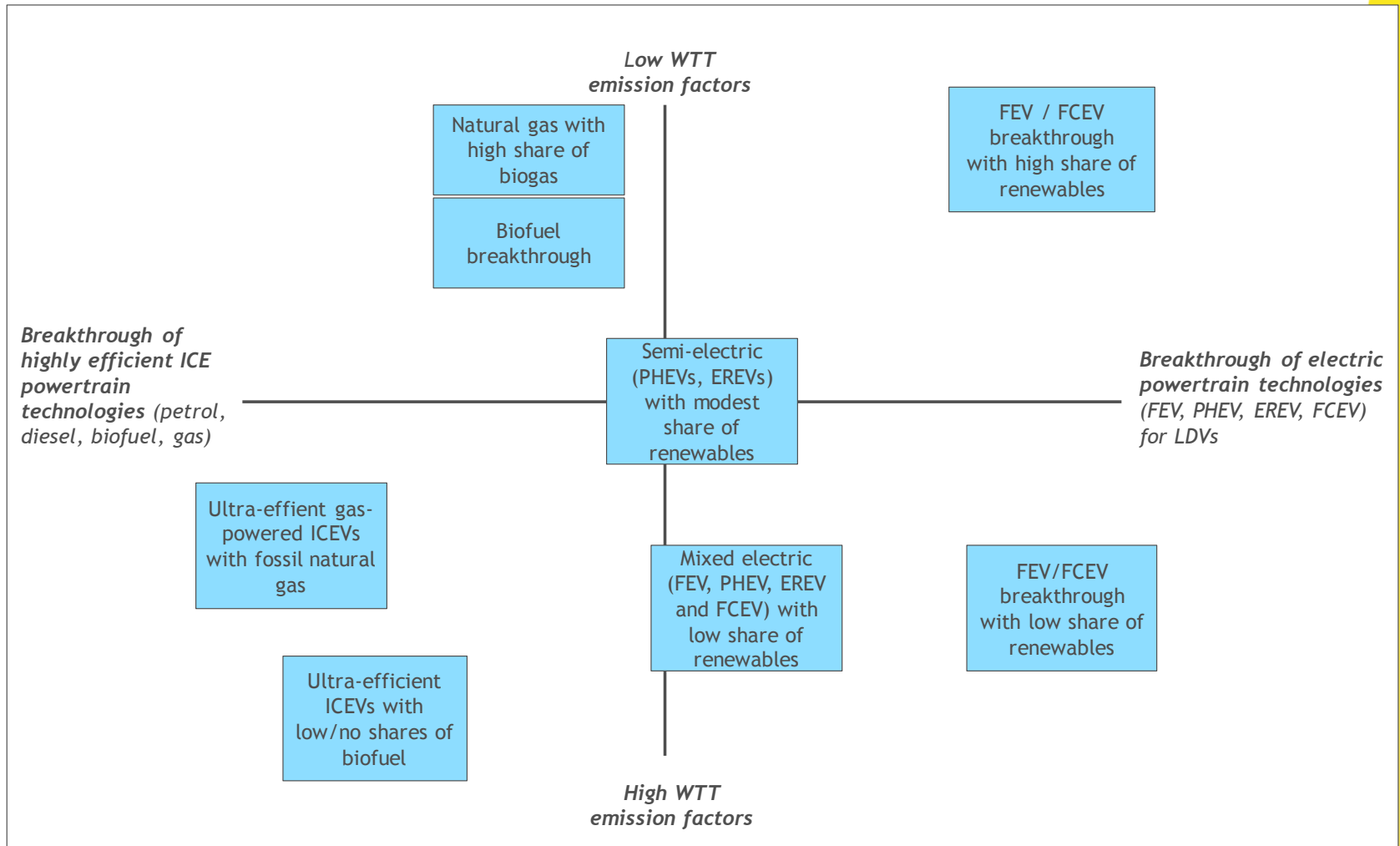
Phase 1 - WP1: Collection of available information

- Synthesis of previous literature on modalities:
 - Previous studies commissioned by DG CLIMA, e.g.:
 - Evaluation of existing Regulation
 - Competitiveness impact of LDV CO₂ Regulations
 - Studies for the 2020 Regulations on cars and LCVs (SR1 and SR3)
 - Studies on different regulatory approaches and regulatory metrics (SR4 and SR8)
 - Other relevant literature, e.g. studies from the US
- Main findings summarised in one factsheet per modality

Phase 1 - WP2: Development of technology scenarios

- **Brief story line:**
 - With/without breakthrough of certain technologies
 - Decarbonisation of energy carriers
- **Quantification:**
 - Powertrain technology parameters (energy efficiency and penetration rates)
 - Well-to-tank energy parameters
- **Will be used in the assessment to test the robustness of design options**

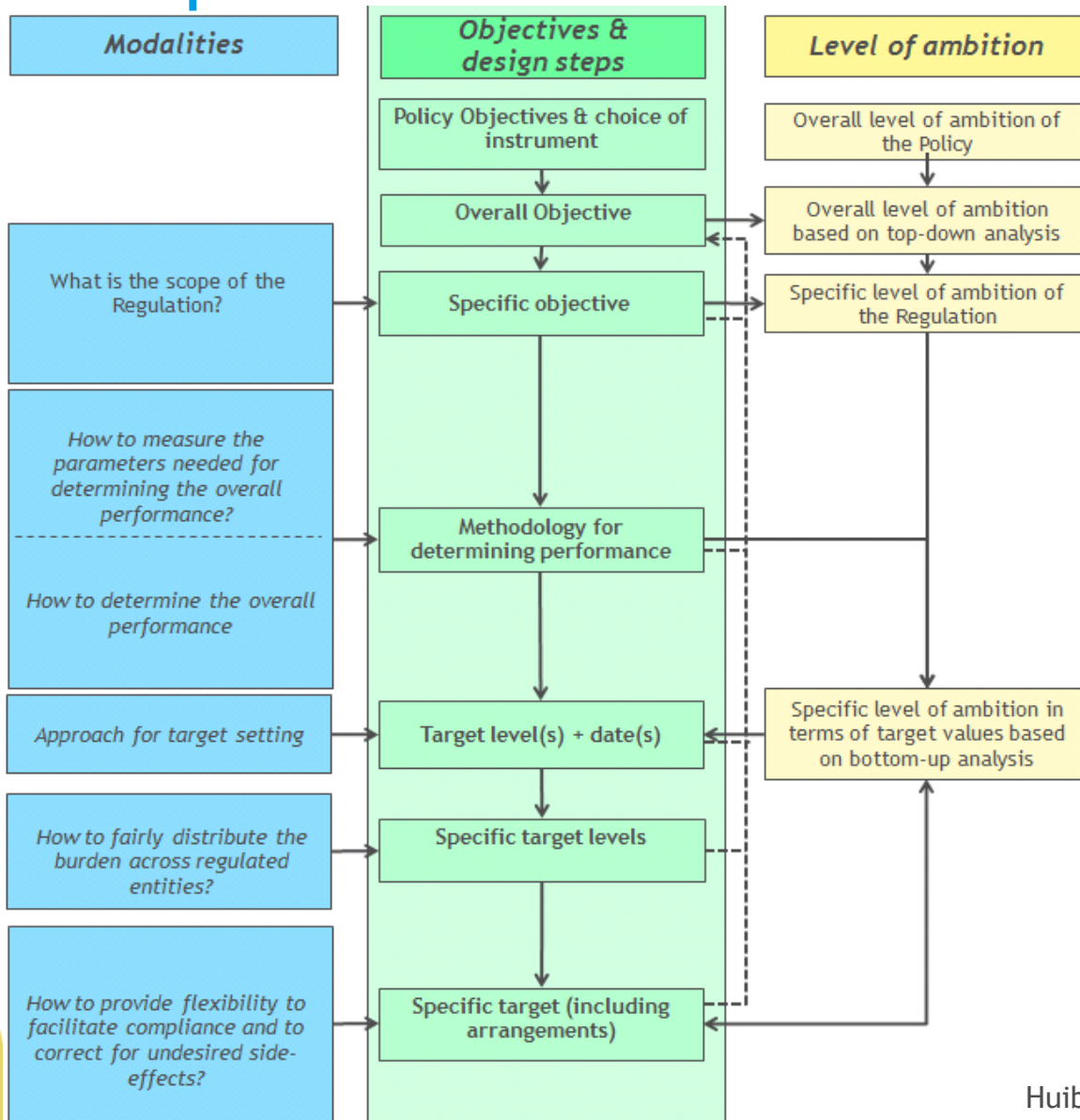
Preliminary examples of technology scenarios



Phase 2: Assessment of relevant elements for post 2020 Regulations

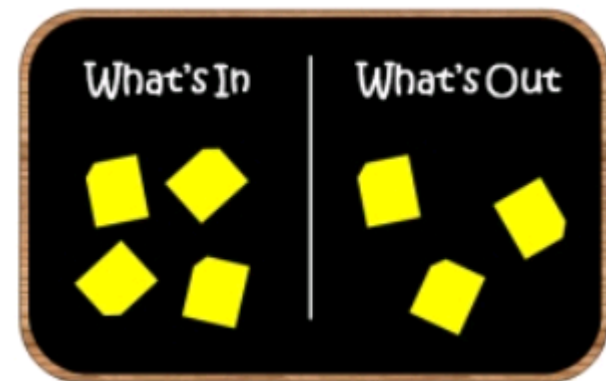
- **Level of ambition:**
 - Bottom-up analysis
 - Top-down analysis
 - Feasibility of target levels
- **Assessment of (combinations of) modalities:**
 - Long list
- **Assessment of most promising combinations:**
 - Long list -> Short list

Conceptual framework



Modalities: What is the scope of the Regulation?

- **Regulated vehicle categories**
 - Only cars (M1) + LCVs (N1) or also (part of) N2 vehicles
- **Regulated entities**
 - Manufacturers or manufacturer groups
- **Metrics**
 - TTW or WTW
 - CO₂ or energy use
- **Embedded emissions**
 - Included or not



Modalities: How to measure the parameters needed for determining the overall performance?

- **Measuring TTW vehicle parameter(s)**
 - Type approval test procedure or on-road ECU data?
 - Specific additional test procedures?
- **Determining WTT parameters (if included)**
 - EU or Member State level?
 - Single year or projections?
- **Determining parameter(s) for embedded emissions (if included)**
 - Default values or harmonised LCA-reporting by OEMs?



Modalities: How to determine the overall performance?

- **Rewarding off-cycle reductions**
 - Eco-innovations or off-cycle credits?
- **Rewarding or penalising technologies**
 - Super credits or minimum shares of ZEVs
 - Debits / corrections for technologies that are over-incentivised w.r.t. real word reductions
- **Aggregation & weighting**
 - Technology specific targets or one target for all
 - Sales-weighted average limits or sales and mileage-weighted limits

=> Definition of sales: EU or MS averages?

REWARD
FOR HIGH
PERFORMANCE

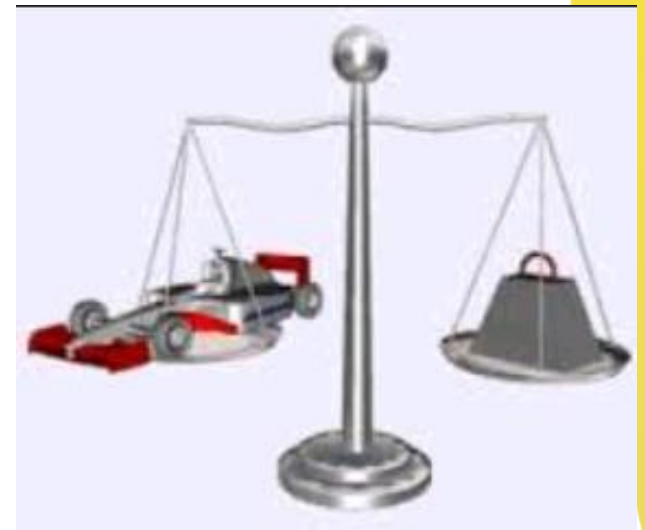
Modalities: Approach for target setting

- Approach for target setting
 - Targets for fixed dates/periods (no intermediate targets)
 - Annually declining targets
 - With phase-in
 - No phase-in
- ⇒ Definition of target year(s)/period(s)



Modalities: How to fairly distribute the burden across regulated entities?

- **Utility parameter**
 - No differentiation or utility parameter
 - Utility based on mass (with or without correction) or footprint
- **Shape and slope of the target function**
 - Linear vs. non-linear target functions
 - Based on equal percentage retail price increase or percentage CO₂ decrease?



Modalities: How to provide flexibility to facilitate compliance and to correct for undesired side-effects? (1)

- **Pooling**
 - No pooling vs. sales (and mileage) weighted pooling
 - Pooling between cars and vans targets or not
- **Trading of CO₂ credits**
 - No trading of credits or trading
 - Trading between cars and vans or not

=> Definition of what is traded + temporal aspects
- **Excess emission premiums**
 - Included or excluded



Modalities: How to provide flexibility to facilitate compliance and to correct for undesired side-effects? (2)

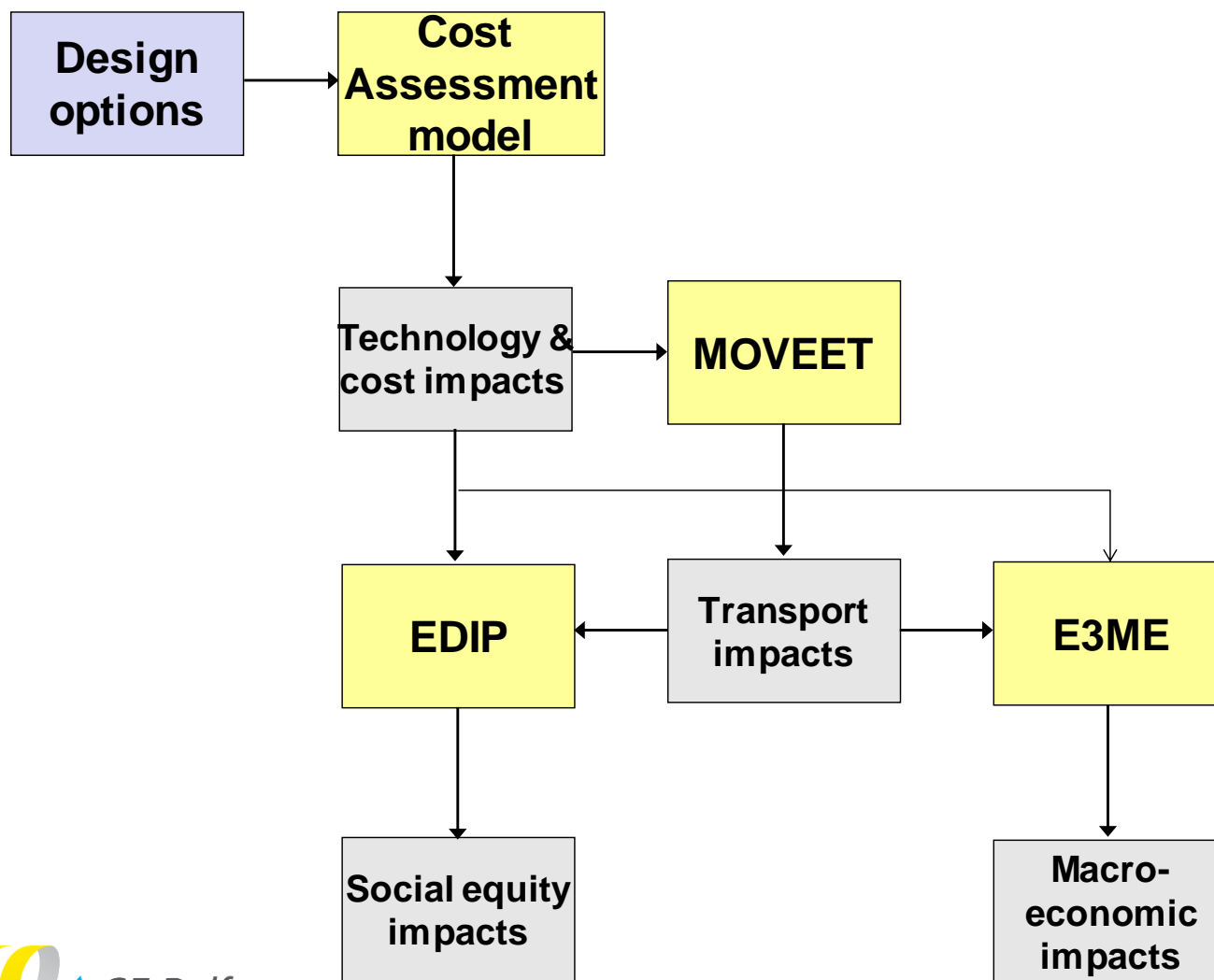
- **Banking / borrowing**
 - Allowed or not
 - Only banking or both
- **Derogations**
 - Small and/or niche derogations
 - Based on EU sales or global sales
 - For certain vehicle types or for OEMs
- **Corrections for undermining the achievement of the target**
 - Adjustment of m_0 in the target function or not



Phase 3: Impact assessment & Recommendations

- Assessment of modalities
- Long list of combinations of modalities
- Selection of short list: design options
- Impact assessment of short list of design options (incl. model runs)
- Policy Recommendations
 - Most desirable design options
 - Identification of open issues that require further assessment
- Key criteria in assessments:
 - Effectiveness / Robustness
 - Cost effectiveness
 - Social equity
 - Competitiveness
 - Technology neutrality

Modeling approach



Stakeholder consultation: on-line questionnaire

- To assess stakeholder preferences with respect to different (options for) modalities
- Responses from individual companies are welcome, no need for single responses per stakeholder group (saves time for coordination)
- Various statements on design options: (fully) (dis)agree
- Two open questions:
 - Modalities to be adjusted/eliminated
 - New design options to be added
 - Argumentation
- Available from: www.cedelft.eu/ce/questionnaire/906
- Questionnaire open until 31 January 2015



Stakeholder consultation: meetings

- **First meeting**
 - Probably in May 2015
 - To present and discuss draft results of:
 - Levels of ambition
 - Assessment of modalities (long list)
 - Definition of short list of design options
- **Second meeting**
 - Probably in July 2015
 - To present the draft results of the assessment of design options



Questions?

