

ANSWER-TIMES Live Demonstration

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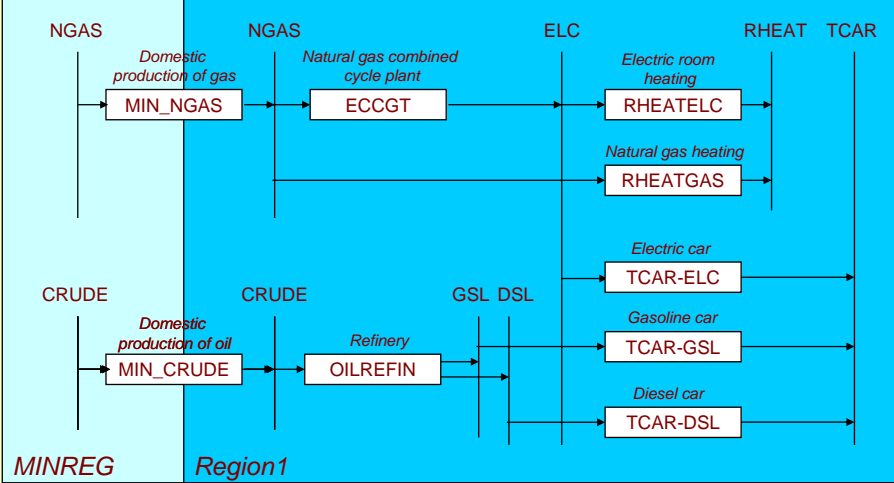


Live ANSWER-TIMES Demonstration – Overview

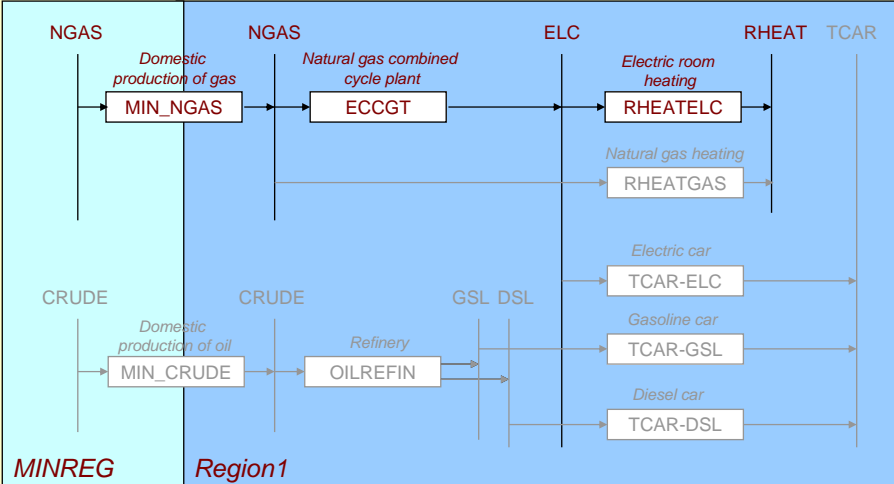
- ◆ *Create miniature single-region TIMES model from scratch (manually and by Excel import)*
 - *Defining processes, commodities & timeslices*
- ◆ *Specify Rule-based User Constraint*
- ◆ *Add Datayears and model run periods*
- ◆ *Use bulk-copying facilities to replicate single-region model in several other regions*
- ◆ *Specify trade between regions*



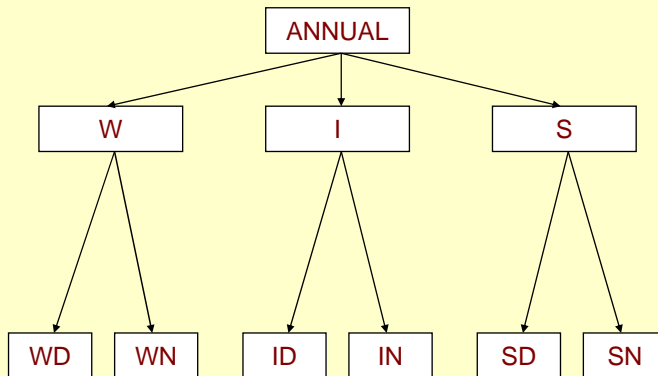
Reference energy system



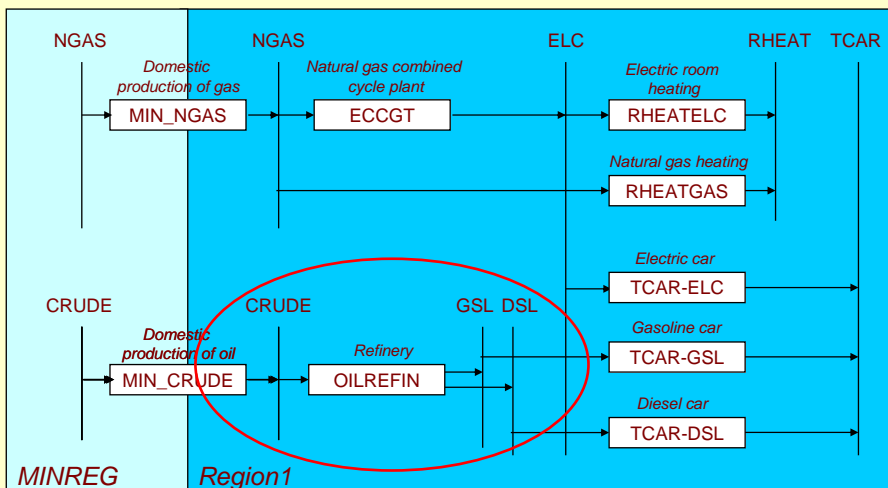
Defining processes and commodities



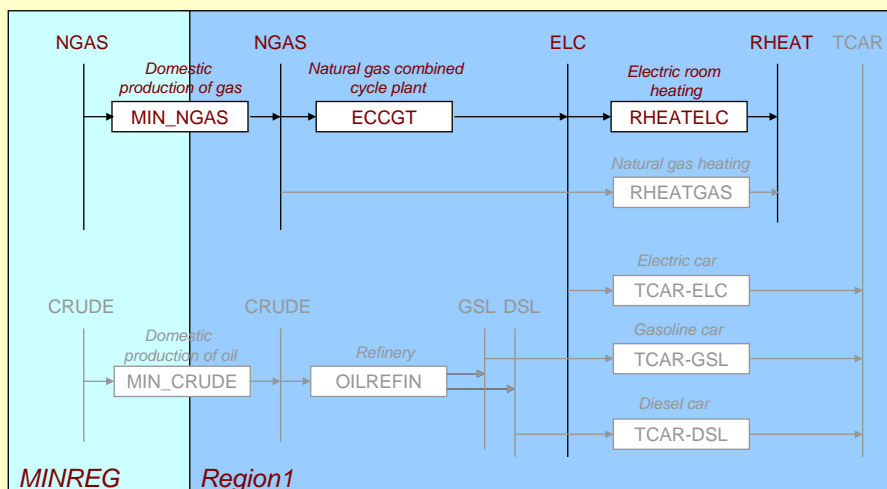
Adding time slices and load curves



Defining flexible processes



Defining processes and commodities



Create miniature single-region TIMES model from scratch - 1

◆ Nine TimeSlices (apart from ANNUAL)

◆ Eight Commodities

- CRUDE, NGAS
- DSL, GSL, ELC
- RHEAT, TCAR (demands)

◆ Ten Processes

- MIN_CRUDE, MIN_NGAS (extraction)
- OILREFIN, ECCGT
- RHEATELC, RHEATGAS (DMDs for RHEAT)
- TCAR-DSL, TCAR-GSL, TCAR-ELC (DMDs for TCAR)

Create miniature single-region TIMES model from scratch - 2

New form to allow specification of I/O Commodities, PCG

The screenshot shows a software window titled "Item Information" with a "Scenario" dropdown set to "BASE" and "Stanford demo". Below it, "Name, Desc:" is "OILREFIN" and "REG1" is selected in a dropdown, with "Oil Refinery" in a text field. The "I/O Commodities" tab is active, showing two tables. The left table, "Input based Process Activity", has columns for "CommN", "Description", "Type", and "PCG". It lists "CRUDE1" (Crude Oil 1, NRG, checked) and "CRUDE2" (Crude Oil 2, NRG, checked). The right table, "Output based Process Activity", has columns for "CommOUT", "Description", and "Type", listing "DSL" (Diesel in REG1, NRG) and "GSL" (Gasoline, NRG). At the bottom, there are "Add Comm." and "Remove Comm." buttons for both tables, and a note: "Use Add/Remove Comm buttons to add/delete Input Commodities. In the PCG column, check Commodities of the same type that comprise the PCG." and "Use Add/Remove Comm buttons to add/delete Output Commodities."



Use bulk-copying facilities to replicate single-region model in several other regions

- ◆ **Create new Regions**
 - Specify Global tab parameters
- ◆ **Bulk-copy TimeSlices**
 - Copy Season TimeSlices first, then DayNite TimeSlices
- ◆ **Bulk-copy Commodities**
- ◆ **Bulk-copy Commodity Groups**
- ◆ **Bulk-copy Processes**



Specify trade between regions - 1

New TradeProcess Tab (no Region column in Items listview)

The screenshot shows the 'TradeProcess' tab in the ANSWER Energy Modeling software. The main window displays a list of trade processes, with 'TRD_NGAS' selected. Below the list, there is a 'Subset Parameters' section with a table showing parameters for 'TRDNGAS' across different scenarios and regions.

Scenario	Parameter	Region	Region2	Process	Commodity	Item3	Commodity	Item5	Item6	2005	2010
M	TRDNGAS	PRC_ACTUNT	REG1	-	TRD_NGAS	NGAS	-	-	-	-	1
M	TRDNGAS	PRC_ACTUNT	REG2	-	TRD_NGAS	NGAS	-	-	-	-	1
M	TRDNGAS	PRC_CAPACT	REG1	-	TRD_NGAS	NGAS	-	-	-	1.0000	-
M	TRDNGAS	PRC_CAPACT	REG2	-	TRD_NGAS	NGAS	-	-	-	1.0000	-
M	TRDNGAS	TOP_IRE	REG1	REG2	TRD_NGAS	NGAS	-	-	NGAS	-	1



Specify trade between regions - 2

New form to allow specification of Trade Process

The screenshot shows the 'New Trade Process in scenario TRDNGAS' form. The form includes fields for Scenario, Name, and Description, and a 'Traded Commodities' section with a matrix for specifying trade between regions (REG1, REG2, REG3, REG4).

Scenario: TRDNGAS allow trade in NGAS from REG1 to REG2
 Name, Desc: TRD_NGAS Trade in nat. gas
 Copy Declaration Only, Not Data

Traded Commodities
 Specify Trade Matrix of Export, Import Commodities for Regions between which Trade occurs:

EXP\IMP	REG1	REG2	REG3	REG4
Commodities	NGAS	NGAS		
REG1		<input checked="" type="checkbox"/>		
REG2				
REG3				
REG4				



Specify Rule-based User Constraint - 1

Electric car at least 10% of automobile transport demand

1. Define TechFilter ALLTRN_DMD to select all automobile transport DMDs

New Technology Items Filter

Enter Name, Description, Comment and Specify Filter for New Technology Items Filter

Name: ALLTRN_DMD Description: All transport DMDs

Comment:

Technologies to be Included:

	Name	Description	Set Memberships	Input Commodity	Output Commodity
Look for:			PRC_DMD		= "TCAR"
or:					
or:					
or:					
or:					
or:					



Specify Rule-based User Constraint - 2

2. Define Rule-based User Constraint, using UCRULE_ACT and TechFilter ALLTRN_DMD

Stanford demo - ANSWER-TIMES Energy Modellog

Global | TimeSlice | Commodity | Commodity | Process | TradeProcess | Constraint | Parameter

Items Filter: *All User-Defined Constraints (UC_*)

Name	Region	Description	Status
UC_CAR-ELC	REG1	Electric car at least 10% of transport demand	SM

Item Management: Current User Defined Constraint: UC_CAR-ELC

Subst Parameters: *C User-Defined Constraints

Scenario	Parameter	Region	Constraint	Side	Proc/Filter	Commod	TimeSic	Units	2005	2010	2015	2020
M	UCCARELLC	UC_RHSRT	REG1	UC_CAR-ELC	-	-	LD	0.0000	0.0000	0.0000	0.0000	0.0000
M	UCCARELLC	UC_ACT	REG1	UC_CAR-ELC	LHS	TCAR-ELC	-	ANNUAL	1.0000	1.0000	1.0000	1.0000
M	UCCARELLC	UC_T_EACH	REG1	UC_CAR-ELC	-	-	-	-	1	1	1	1
M	UCCARELLC	UCRULE_ACT	REG1	UC_CAR-ELC	LHS	ALLTRN_DMD	-	ANNUAL	-0.1000	-0.1000	-0.1000	-0.1000
Add	UCCARELLC											

Scenario	Parameter	Region	Constraint	Side	VarType	ParamN	TimeSic	Value
M	UCCARELLC	UC_R_EACH	REG1	UC_CAR-ELC	-	-	-	1
M	UCCARELLC	UC_TS_SUM	REG1	UC_CAR-ELC	-	-	ANNUAL	1
Add	UCCARELLC							

Database: C:\Answer\TIMES\Answer_Databases\Stanford demo.mdb Edit Scenario: UCCARELLC



Specify Rule-based User Constraint - 3

3. Resolve Rule-based Constraint (to check we got it right)

Items Filter: Sets Named *All User-Defined Constraints (UC_N)

Name	Region	Description	Status
UC_CAR-ELC	REG1	Electric car at least 10% of transport demand	SM

Item Management
Current User-Defined Constraint: UC_CAR-ELC

Resolve Rule-based Constraint UC_CAR-ELC in region REG1

Case Selection

Select Case... Name:
 Desc: Temporary Case comprising selected scenarios, used for Resolve Rule-based Constraint
 Scenario Details... Scen:

The spread displays how the TS part of the Rule-based Constraint will be resolved at Run Model time for Case: _SELSCEN
 The TID part of the Rule-based Constraint will match what is displayed in the TID spread.

Scenario	Parameter	Region	Constraint	Side	Technology	Commodi	TimeSlice	Bound	2005	2010	2015	2020
UCCARELC	UC_RHSRT	REG1	UC_CAR-ELC	-	-	-	-	LO	0.0000	0.0000	0.0000	0.0000
UCCARELC	UC_ACT	REG1	UC_CAR-ELC	LHS	TCAR-DSL	-	ANNUAL	-	-0.1000	-0.1000	-0.1000	-0.1000
UCCARELC	UC_ACT	REG1	UC_CAR-ELC	LHS	TCAR-ELC	-	ANNUAL	-	0.9000	0.9000	0.9000	0.9000
UCCARELC	UC_ACT	REG1	UC_CAR-ELC	LHS	TCAR-GSL	-	ANNUAL	-	-0.1000	-0.1000	-0.1000	-0.1000
UCCARELC	UC_T_EACH	REG1	UC_CAR-ELC	-	-	-	-	-	1.0000	1.0000	1.0000	1.0000