

# ANSWER-TIMES update

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ETSAP Annex XI Meeting

Venezia, Italy

16 June 2009



## ANSWER-TIMES status at July 2008 Paris ETSAP Meeting - 1

- ◆ *Initial production version of ANSWER-TIMES released shortly before Paris Meeting*
- ◆ *All standard TIMES Sets and Parameters in v2.6.0 TIMES GAMS code recognized (also some VDA extension parameters)*
- ◆ *Data year – model year independence supported*
- ◆ *“Run Model” enhanced to allow specification of Milestone Years, B and E*
- ◆ *All Home Screen and Data Screen functions operational, except “Import TIMES GAMS DD” facility*
- ◆ *Process tab facilities enhanced to better handle special needs of TIMES, with new form to specify I/O commodities and PCG*
  - *Technology (Process) Items Filters facility available (as for ANSWER-MARKAL)*



## ANSWER-TIMES status at July 2008 Paris ETSAP Meeting - 2

- ◆ *Trade Process form completely revised to simplify handling of Trade Processes that involve trade in multiple commodities*
- ◆ *All types of TIMES User Constraints handled*
  - Rule-based Constraints facility available (as for ANSWER-MARKAL)
- ◆ *VEDA-BE needed to calculate aggregate results*
- ◆ *Documentation comprised Preliminary ANSWER-TIMES User Manual (documenting facilities that differed from ANSWER-MARKAL)*
  - With user needing to refer to ANSWER-MARKAL User Manual for documentation of ANSWER-TIMES facilities that operate identically to those in ANSWER-MARKAL



## ANSWER-TIMES enhancements since Paris ETSAP Meeting - 1

- ◆ *When creating a New Database, user can choose between Max. Item Length of 16 or 24*
- ◆ *Lumpy Investment and Endogenous Technology Learning (ETL) TIMES extensions handled*
- ◆ *“File, Import TIMES GAMS DD” facility available to users*
  - Tested by importing large multi-region VEDA-generated TIMES GAMS DDs into ANSWER and then running out of ANSWER, replicating optimal value
  - Builds confidence in integrity of ANSWER-TIMES and “Run Model” facility
- ◆ *“Batch Run” facility operational*
- ◆ *G\_DYEAR parameter can now be specified in ANSWER-TIMES database, and its value is automatically inserted in \*.GEN file*
- ◆ *All standard TIMES Sets and Parameters in v2.9.0 TIMES GAMS code recognized (also Lumpy Investment, ETL, VDA extension parameters)*



## ANSWER-TIMES enhancements since Paris ETSAP Meeting - 2

- ◆ **February 2009: ANSWER-TIMES version 6.5.5 update released**
  - “New” simplified format for ITEMS data in Excel load templates used for “Import Model Data from Excel” facility
  - “Export Scenario Data to Excel” facility exports to Excel in the “new” load template format, and recoded to run much more quickly than previously
  - \*.IMP files created by “Export Scenario” and expected by “Import Scenario” also created in analogous “new” format
  - Improved and simplified display of Set Memberships, now corresponding very closely to Sets in TIMES
  - Process Items Filter facility enhanced to allow filtering of Input and Output Commodities by Commodity Name / Description / Set Memberships
- ◆ **March 2009: Fully self-contained ANSWER-TIMES User Manual (Reference Manual) released**



## Details of ANSWER-TIMES version 6.5.5 enhancements - 1

- ◆ **“New” simplified format for ITEMS data in Excel load templates used for “Import Model Data from Excel”, “Export Scenario Data to Excel”**

	A	B	C	D	E	F
1	ITEMS	UTOPIA				
25	T	E01	Coal Steam Electric	PJ.GW	PRC.ELE.DAYNITE	
26	T	E21	LWR Nuclear Plant	PJ.GW	PRC.ELE.SEASON	
27	T	E31	Hydro-electric Plant	PJ.GW	PRC.ELE.DAYNITE	
28	T	E41	Natural gas combined-cycle plant	PJ.GW	PRC.ELE.DAYNITE	
29	T	E51	Pumped Storage Power Plant	PJ.GW	PRC.ELE.STGTSS.DAYNITE	
30	T	E70	Oil Plant	PJ.GW	PRC.ELE.DAYNITE	
31	T	IMPDSL1	Import of Diesel	PJ.PJa	PRC.PRE.ANNUAL.IRE	
32	T	IMPGAS1	Import of Uranium	PJ.PJa	PRC.PRE.ANNUAL.IRE	
33	T	IMPGSL1	Import of Gasoline	PJ.PJa	PRC.PRE.ANNUAL.IRE	
34	T	IMPHCO1	Import of Hard Coal	PJ.PJa	PRC.PRE.ANNUAL.IRE	
35	T	IMPOIL1	Import of Crude	PJ.PJa	PRC.PRE.ANNUAL.IRE	
36	T	IMPURN1	Import of Uranium	PJ.PJa	PRC.PRE.ANNUAL.IRE	
37	T	RHE	Electric Boiler	PJ.PJa	PRC.DMD.DAYNITE	
38	T	RHG	Gas/oil Boiler	PJ.PJa	PRC.DMD.ANNUAL	
39	T	RHO	Diesel Boiler	PJ.PJa	PRC.DMD.DAYNITE	
40	T	RL1	Standard Incandescent Lighting	PJ.PJa	PRC.DMD.ANNUAL	
41	T	SRE	Oil Refinery	PJ.PJa	PRC.PRE.ANNUAL	
42	T	TXD	Diesel Car	PJ.PJa	PRC.DMD.ANNUAL	
43	T	TXE	Electric Car	PJ.PJa	PRC.DMD.ANNUAL	
44	T	TXG	Gasoline Car	PJ.PJa	PRC.DMD.ANNUAL	



## Details of ANSWER-TIMES version 6.5.5 enhancements - 2

- ◆ **Improved and simplified display of Set Memberships, now corresponding very closely to Sets in TIMES**

- **User defined Sets Filters defined via the [Sets Filter...] button**

Global	TimeSlice	Commodity	CommGroup	Process	TradeProcess	Constraint	Parameter
Items Filter							
<input checked="" type="radio"/> Sets <input type="radio"/> Named <b>PRE+ANNUAL Processes (user defined)</b> <input type="button" value="Sets Filter..."/>							
Name	Region	Description	Status	- Item Management -			
IMPDSL1	DEMO	Import of Diesel		Current Process: IMPDSL1			

Previously:

Global	TimeSlice	Commodity	CommGroup	Process	TradeProcess	Constraint	Parameter
Items Filter							
<input checked="" type="radio"/> Sets <input type="radio"/> Named <b>PRC_PRE+PRC_ANNUAL Processes (user defined)</b> <input type="button" value="Sets Filter..."/>							
Name	Region	Description	Status	- Item Management -			
IMPDSL1	IMPEXP	Import of Diesel		Current Process: IMPDSL1			

- **Similarly for Set Memberships in column F of “new” Excel load templates ITEMS format, specification of Set Memberships for Process Items Filter facility**



## Details of ANSWER-TIMES version 6.5.5 enhancements - 3

- ◆ **Process Items Filter facility enhanced to allow filtering of Input and Output Commodities by Commodity Name / Description / Set Memberships**

- **Previously just filtering by Commodity Name, now Commodity Description and Commodity Set Memberships are also allowable filters**

Edit Process Items Filter							
Edit Name or Description or Comment, or optionally modify Filter for Process Items Filter TRN-DSL: Transport demand devices with diesel as input commodity							
Name:		Description:					
TRN-DSL		Transport demand devices with diesel as input commodity					
Comment:							
Processes to be Included:							
Look for:	Process Name	Process Desc	Process Sets	Input Comm Name	Input Comm Desc	Input Comm Sets	Output Comm Name
or:	Like "T**"		DMD		Like "**diesel**"		



## Intended ANSWER-TIMES Developments in remainder of 2009

- ◆ **Create ANSWER-TIMES Getting Started Manual**
  - Emphasis on concretely illustrating all of the standard TIMES concepts via demonstration ANSWER-TIMES databases
- ◆ **Develop “smart” spreadsheets to expedite bulk-loading data into ANSWER-TIMES database**
  - Add “smart” buttons including [Check Sheet] to simplified ITEMS sheet, and to TS DATA, TID DATA sheets
- ◆ **Complete investigation of feasibility of incorporating Library region approach into ANSWER-TIMES**
  - Similar to Library region approach in ANSWER-MARKAL but utilizing new improved Process Items Filter
- ◆ **Provide support for extended TIMES model variants**
  - Elastic Demand (already supported, but improve), TIMES Climate Module, TIMES-MACRO, Stochastic TIMES



## Acknowledgments

- ◆ **Antti Lehtila, VTT Energy Finland, for his generous assistance from 2005 through 2009 in:**
  - Answering numerous TIMES queries, making enhancements to the TIMES GAMS code, making suggestions that have benefitted various aspects of the ANSWER-TIMES interface, and fielding TIMES queries from ANSWER-TIMES clients
- ◆ **Uwe Remme, IER Germany, for his generous assistance in:**
  - Answering TIMES queries as far back as Dec. 2004, taking the lead role in ANSWER-TIMES training provided to ITRI Taiwan in September 2008, making ANSWER-TIMES presentations at several recent ETSAP Meetings, and fielding TIMES queries from ANSWER-TIMES clients
- ◆ **GianCarlo Tosato, ETSAP Project Head, for providing funding assistance to Noble-Soft Systems**

