

The most recent ANSWER-TIMES enhancements

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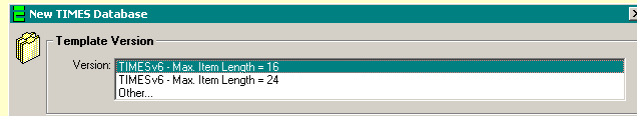
Reminder: Enhancements between Brasilia & Paris ETSAP Meetings

- ◆ *Simplified handling of TimeSlices where same TimeSlices in every region*
 - Still possible to handle models with different TimeSlices in different regions
- ◆ *New/Edit Trade Process form completely revised*
 - Allows handling of Trade Processes that involve trade in multiple commodities, while retaining full generality of naming permitted by TIMES
- ◆ *TIMES interpolate/extrapolate options for time-series parameters handled*
- ◆ *Preliminary ANSWER-TIMES User Manual completely rewritten*
- ◆ *Initial ANSWER-TIMES production version released*

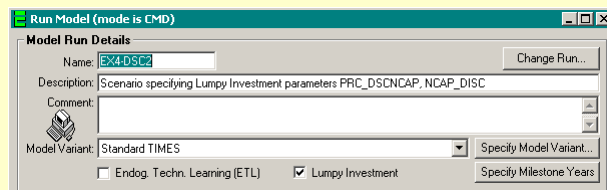


Enhancements since Paris ETSAP Meeting - 1

- ◆ *When creating a New Database, can choose between Max. Item Length of 16 or 24*



- ◆ *ANSWER-TIMES now handles Lumpy Investment and Endogenous Technology Learning (ETL) TIMES extensions*



Enhancements since Paris ETSAP Meeting - 2

- ◆ *The “Batch Run” facility is now operational*
- ◆ *G_DYEAR parameter can now be specified in ANSWER-TIMES database, and its value is automatically inserted in *.GEN file*
- ◆ *“File, Import TIMES GAMS DD” facility now 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*
- ◆ *Latest ANSWER-TIMES version 6.5.0 is now available, running against ANSWER-aware TIMES GAMS code version 2.9.0*
 - *Will be used for Sophia-Antipolis ANSWER-TIMES training on Wed. December 17*
- ◆ *ANSWER-TIMES Preliminary User Manual updated for version 6.5.0 enhancements*



“File, Import TIMES GAMS DD” facility

Import TIMES GAMS Data Dictionary

Import TIMES GAMS Data Dictionary allows scenario information in a TIMES GAMS data dictionary to be imported into an ANSWER-TIMES database.

TIMES GAMS Data Dictionary:
C:\AnswerTIMESv6\Ans_WikT\BASE.MATISSE.DD Browse...

RUN File specifying SET ALL_TS, SET MILESTONYR, G_DYEAR:
C:\AnswerTIMESv6\Ans_WikT\MATISSE.RUN Browse...

Import Step 1

Create New Database from DD info Use Current Database

Sparse Import of TS Data Dense Import of TS Data

Import Step 2

Import into Scenario:
BASE Regions...

No. of Significant Digits for Numeric Data : 12

Progress

Import Step 1 Import Step 2 Close

- ◆ Inputs are *.DD and *.RUN file (*.DD file can \$INCLUDE other *.DD files)
- ◆ Automatic creation of New Database for either Sparse Import (Data Time Periods match SET DATAYEAR) or for Dense Import (Data Time Periods match SET MILESTONYR)
- ◆ User specifies no. of significant digits in *.IMP file created for Import into ANSWER-TIMES database
- ◆ Two-Step Import process



Enhancements in progress

- ◆ **New simplified *** ITEMS *** format for “Import Model Data from Excel”**
 - Thanks to Uwe Remme, IER Germany, for valuable discussions
- ◆ **“Export Scenario Data to Excel” now exports using (same) new simplified *** ITEMS *** format**
 - And has been recoded to run many times faster than previously
- ◆ **“Export Scenario”, “Import Scenario” also incorporate (same) new simplified *** ITEMS *** format**
- ◆ **Coding for the simplified format is complete, new EXE will be released as soon as tested and Preliminary User Manual updated**
- ◆ **Work continues on creating ANSWER-TIMES User Manual (Reference Manual) by merging ANSWER-TIMES Preliminary User Manual and ANSWER-MARKAL User Manual**



“Old” Format for * ITEMS *** for Import Model Data from Excel**

(Multiple rows for each Item, complicated format for some rows)

A	B	C	D	E
*** ITEMS ***	REG			
Item:	T	E01	Coal Steam Electric	
Sets:	PRC	PRC_ELE	PRC_DAYNIT	
Units:	TACT=	PJ	TCAP=	GW
Comment:				
Comment for E01.				
End Comment:				
*				
Item:	T	E21	LWR Nuclear Plant	
Sets:	PRC	PRC_ELE	PRC_SEASON	
Units:	TACT=	PJ	TCAP=	GW
Comment:				
End Comment:				
*				



“Smart” Format for * ITEMS *** for Import Model Data from Excel**

Single row for each Item with Component, Name, Description, Units, Set Memberships, Comment in columns B, C, D, E, F, G resp.

A	B	C	D	E	F	G
*** ITEMS ***	REG					
E	CO2	Carbon Dioxide	kt	COM,COM_ENV,COM_ANNUAL,COM_ENVGHG		
E	DSL	Diesel	PJ	COM,COM_NRG,COM_ANNUAL,COM_NRGFOS		
E	ELC	Electricity	PJ	COM,COM_NRG,COM_DAYNIT,COM_NRGELC		
E	GAS	GAS	PJ	COM,COM_NRG,COM_ANNUAL,COM_NRGFOS		
E	GSL	Gasoline	PJ	COM,COM_NRG,COM_ANNUAL,COM_NRGFOS		
E	HCO	Coal	PJ	COM,COM_NRG,COM_ANNUAL,COM_NRGFOS		
E	HYD	Hydro Power	PJ	COM,COM_NRG,COM_ANNUAL,COM_NRGFRE		
E	OIL	Oil	PJ	COM,COM_NRG,COM_ANNUAL,COM_NRGFOS		
E	RH	Residential Space Heating	PJ	COM,COM_DEM,COM_DAYNIT,COM_DEMRES		
E	RL	Residential Lighting	PJ	COM,COM_DEM,COM_ANNUAL,COM_DEMRES		
E	TX	Automobile Transportation	PJ	COM,COM_DEM,COM_ANNUAL,COM_DEMTRN		
E	URN	Natural Uranium	PJ	COM,COM_NRG,COM_ANNUAL,COM_NRGNUC		
T	E01	Coal Steam Electric	PJ,GW	PRC,PRC_ELE,PRC_DAYNIT		Comment for E01
T	E21	LWR Nuclear Plant	PJ,GW	PRC,PRC_ELE,PRC_SEASON		
T	E31	Hydro-electric Plant	PJ,GW	PRC,PRC_ELE,PRC_DAYNIT		
T	E41	Natural gas combined-cycle plant	PJ,GW	PRC,PRC_ELE,PRC_DAYNIT		
T	E51	Pumped Storage Power Plant	PJ,GW	PRC,PRC_ELE,PRC_STGTSS,PRC_DAYNIT		
T	E70	Oil Plant	PJ,GW	PRC,PRC_ELE,PRC_DAYNIT		



ANSWER-TIMES Status Summary December 2008 - 1

- ◆ ***ANSWER-TIMES production version 6.5.0 now available***
 - Contact Ken Noble (noblesoft@netspeed.com.au)
 - VEDA-BE needed for results handling
- ◆ ***All standard TIMES Sets and Parameters in latest v2.9.0 TIMES GAMS code recognized***
 - Along with ETL and Lumpy Investment Sets and Parameters (also some VDA extension Parameters)
- ◆ ***Data year – model year independence supported***
- ◆ ***TIMES interpolate/extrapolate options for time-series parameters supported***



ANSWER-TIMES Status Summary December 2008 – 2

- ◆ ***All Home Screen and Data Screen functions operational***
 - Including “Import TIMES GAMS DD”
- ◆ ***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)
 - Future enhancement of Process tab facilities anticipated
- ◆ ***New/Edit Trade Process form simplifies handling of Trade Processes that involve trade in multiple commodities, while retaining full generality of naming permitted by TIMES***
- ◆ ***All types of TIMES User Constraints are handled***
 - Rule-based Constraints facility available (as for ANSWER-MARKAL)



Intended Developments in 2009

- ◆ **Complete work on ANSWER-TIMES User (Reference) Manual**
 - Self-contained manual documenting all ANSWER-TIMES features
- ◆ **Develop ANSWER-TIMES “smart” spreadsheets**
 - Add “smart” buttons including [Check Sheet] to simplified *** ITEMS *** sheet, and to *** TS DATA *** , *** TID DATA *** sheets
- ◆ **Create ANSWER-TIMES Getting Started Manual**
 - Emphasis on concretely illustrating all of the standard TIMES concepts via demonstration ANSWER-TIMES databases
- ◆ **Further enhance Process tab facilities**
- ◆ **Further enhance “Import TIMES GAMS DD” facility**
 - More TIMES GAMS DDs needed for testing integrity of this facility!
- ◆ **Revisit MARKAL-to-TIMES conversion issue?**



Acknowledgments

- ◆ **Antti Lehtila, VTT Energy Finland, for his extremely generous assistance from 2005 through 2008 in:**
 - Answering numerous TIMES queries, making enhancements to the TIMES GAMS code, and making suggestions that have benefitted various aspects of the ANSWER-TIMES interface
- ◆ **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, and his roles in ANSWER-TIMES presentations at several recent ETSAP Meetings
- ◆ **GianCarlo Tosato, ETSAP Project Head, for providing funding assistance to Noble-Soft Systems**

