

ANSWER “Smart” Templates

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Template Basics

- Workbook is linked to an ANSWER-MARKAL database for unit, set, parameter information
- VBA “macros” enable various text, links and actions to be undertaken via “smart” buttons
- There is a single declaration sheet for each component type (commodity / technology / constraint), and each item is declared once and linked to thereafter
- As part of the declaration process each item’s relationship to the RES is established by means of assignment to the appropriate sets, and designation of its units



Template Basics (Cont.)

- Only those commodities / technologies / constraints declared are available for selection on Data sheets
- Color coded:
 - Black – user input
 - Green – ANSWER-generated MARKAL text
 - Blue - link/reference to a declaration sheet
 - Violet – derived entry (calculation or sum)
- The workbook must adhere to the expectations regarding the “reserved” rows for column headers and columns for item specification [as established]



Template Basics (Cont.)

- Once an entry is made it holds for all rows below until another entry is encountered
- Data can be provided in any (column) order
- Year designation may be
 - Blank for all periods
 - A single period
 - A period range (year1-year2)
- Extensive checking of MARKAL “rules” can be done on each “smart” worksheet by means of the Check Sheet Button



Template Use – Smart Buttons Types

Button	Sheets	Description
Set Membership	Declaration	Presents the ANSWER Set specification form, with the primary Tree and Additional Characteristic, for designation of set membership and thereby "position" in the RES. Form is component (commodity, technology, constraint) sensitive.
Units	Declaration	Presents the ANSWER Units specification form for selection of the appropriate units associated with the item. Form is component (commodity, technology, constraint) sensitive.
Check Sheet	All	Performs thorough Quality Control checks on the information contained in the active sheet. Checks are component (commodity, technology, constraint) sensitive. [Not cursor position sensitive.]
Name/Description/Units	All Data	Establishes a link from a Data sheet to the associated component declaration sheet.
Parameters	All Data	Presents the list of Parameters that are permitted according to the component type.
Qualifiers	All Data	Once a Parameters has been
Comm-In/Comm-Out	Tech_Data	Establishes a link from the Data sheet to the commodity declaration sheet to identify the commodities flowing into and leaving each technology, thereby defining the topology of the RES.
TechName	Const_Data	Establishes a link from the Data sheet to the technology declaration sheet to the technologies involved in a user defined constraint. Such constraints enables a user to establish relationships between groups of technologies (e.g., min/max market share for a fuel type, renewable portfolio standards).



Template Use – Commodities Declaration Sheet with "Smart" Buttons

CommName	CommDesc	CommUnit	Set Memberships	Comment
*Upstream Energy Carriers need for the Dummy Processes				
BIOWOOD	Fuel wood	PJ	ENT_ENC_ESY,SLD	
COABRO	Brown Coal		ENT_ENC_EFS,SLD	
COALIG	Lignite		ENT_ENC_EFS,SLD	
ELC	Electricity		ENT_ELC	
GASGWG	GWG		ENT_ENC_EFS,GAZ	
GASNAT	Natural gas		ENT_ENC_EFS,GAZ	
HET	Heat		ENT_LTH	
OILDST	Distillate		ENT_ENC_EFS,LIO	
OILHFO	Heavy Fuel Oil		ENT_ENC_EFS,LIO	
OILGSL	Gasoline		ENT_ENC_EFS,LIO	
OILLPG	LPG		ENT_ENC_EFS,GAZ	
*all COM Energy Carriers				
AGRBIO	Fuel wood		ENT_ENC_ESY,SLD	
AGRCOA	Coal		ENT_ENC_EFS,SLD	
AGRELC	Electricity		ENT_ELC	
AGRGAS	Gas		ENT_ENC_EFS,GAZ	
AGRLTH	Heat		ENT_LTH	
AGRLPG	LPG		ENT_ENC_EFS,GAZ	



Template Use – Commodities Sheet

Specify Commodity Unit

The screenshot shows the 'Commodities CROATIA' sheet in Microsoft Excel. The dialog box 'Specify Commodity Unit' is open, displaying a treeview of commodity units. The units listed include:

- Billion vehicle kilometers (Bv-km)
- Million tons (M)
- unit of refinery (uref)
- unit of volume for MVDs (uvol)
- unit of weight for MWTs (uwt)
- unit vol (if MVDs being totalled are all in uvol) (uvol?)
- unit wt (if MWTs being totalled are all in uwt) (uwt?)
- unit(?) of DMs being totalled (unitDM?)

The dialog box also contains the instruction: "To specify a Unit, click on the Unit in the treeview and then click on the OK button (or just double-click on the Unit in the treeview)."



Template Use – Commodities Sheet

Specify Energy Set Memberships

The screenshot shows the 'Commodities CROATIA' sheet in Microsoft Excel. The dialog box 'Set Memberships' is open, displaying a treeview of energy set memberships. The memberships listed include:

- Energy Carrier (ENT)
- Storable (ENT)
- Conservation (ECV)
- Fossil (EFS)
- High-Temp Heat or Cooling (EHC)
- Nuclear (ENU)
- Renewable (ERN)
- Synthetic (ESP)
- Electric (ELC)
- District Heat (LTH)
- Fossil Equivalent (FEQ)

The dialog box also contains an 'Additional Characterization' section with radio buttons for:

- Liquid (LQ)
- Solid (SLD)
- Gaseous (GAZ)



Template Use – Technology Data Sheet with “Smart” Buttons

Qualifier	TechName	TechDesc	Units	CommIN	CommOUT	TIB	2000	LIFE	RESID	CF	CAP
	CHLECOA100	Com Space Heat Large COA.00 PJ, P/Ja	COMCOA	CHLE	30	0.13	0.541	1.0			
	CHLEELC100	Com Space Heat Large ELC.00 FPJ, P/Ja	COMELC	CHLE	30	0.43	0.541	1.0			
	CHLEELC200	Com Space Heat Large ELC.00 PJ, P/Ja	COMELC	CHLE	30	0.37	0.541	1.0			
	CHLEGAS100	Com Space Heat Large GAS.00 PJ, P/Ja	COMGAS	CHLE	30	1.55	0.541	1.0			
	CHLEGAS200	Com Space Heat Large GAS.00 PJ, P/Ja	COMGAS	CHLE	30	1.34	0.541	1.0			
	CHLELPG100	Com Space Heat Large LPG.00 PJ, P/Ja	COMLPG	CHLE	30	0.12	0.541	1.0			
	CHLELTH100	Com Space Heat Large LTH.00 FPJ, P/Ja	COMLTH	CHLE	30	1.35	0.541	1.0			
	CHLEOIL100	Com Space Heat Large Oil.00 FPJ, P/Ja	COMOIL	CHLE	30	4.50	0.541	1.0			
	CHSECOA100	Com Space Heat Small COA.00 PJ, P/Ja	COMCOA	CHSE	30	0.04	0.541	1.0			
	CHSEELC100	Com Space Heat Small ELC.00 PJ, P/Ja	COMELC	CHSE	30	0.13	0.541	1.0			



Template Use – Specify Technology Name, Description, Units

Name	Region	Description	Set Membership
CHLECOA100	CROATIA	Com.Space.Heat.Large.COA.00.PJ	TCLDRFD
CHLEELC100	CROATIA	Com.Cooking.Small.ELC.00.FP	TCLDRFD
CHLEELC200	CROATIA	Com.Cooking.E.LC.00.Stove	TCLDRFD
CHLEGAS100	CROATIA	Com.Cooking.GAS.00.Stove	TCLDRFD
CHLEGAS200	CROATIA	Com.Cooking.LPG.00.Stove	TCLDRFD
CHLELPG100	CROATIA	Com.Space.Heat.Large.LPG.00.PJ	TCLDRFD
CHLELTH100	CROATIA	Com.Space.Heat.Large.LTH.00.FP	TCLDRFD
CHLEOIL100	CROATIA	Com.Space.Heat.Large.OIL.00.FP	TCLDRFD
CHSECOA100	CROATIA	Com.Space.Heat.Small.COA.00.PJ	TCLDRFD
CHSEELC100	CROATIA	Com.Space.Heat.Small.ELC.00.PJ	TCLDRFD



Template Use – Specify Technology TS or TID Parameter

The screenshot shows an Excel spreadsheet with the following data in the 'TechData' sheet:

Check Sht	TechName, TechDesc, TACT, TCAP Units	CommIN	CommOUT	LIFE	RESID	CF	CAP
1	CHLECOA100 Com Space Heat Large COA.DD PJ, P,U/a COMCOA.CHLE	30	0.13	0.541	1.0		
2	CHLEELC100 Com S						
3	CHLEELC200 Com S						
4	CHLEGAS100 Com S						
5	CHLEGAS200 Com S						
6	CHLELPG100 Com S						
7	CHLELTH100 Com S						
8	CHLEOIL100 Com S						
9	CHSECOA100 Com S						
10	CHSEELC100 Com S						

The dialog box 'Select TS or TID Technology Parameter' lists the following parameters:

- AF: Annual availability
- AF_TID: Availability for reserves, time of day
- ARAF: Fraction of unavailability which is forced outage
- ARAF: Annual reserve availability
- IBOND(FX): Lower bound on capacity
- IBOND(FX): Fixed bound on capacity
- IBOND(FX): Upper bound on capacity
- IBOND(FX): Lower bound on activity: conversion/process technology
- IBOND(FX): Fixed bound on activity: conversion/process technology
- IBOND(FX): Upper bound on activity: conversion/process technology
- IBOND(FX): Lower bound on activity: resource technology
- IBOND(FX): Fixed bound on activity: resource technology
- IBOND(FX): Upper bound on activity: resource technology
- IBOND(FX): Units of activity: cost of capacity
- IBOND(FX): Status of electricity lost to heat gain
- CF: Annual utilization
- CF: Utilization for reserves, time of day
- CONF: Annual resource cost
- CONF_TID: Salvage value of stockpiled energy carrier at end of horizon
- CONF: Total resource availability
- DEAF: Limit rate at which technology capacity can be reduced
- DEAF: Limit rate at which resource activity can be reduced
- DELIN: Annual delivery cost
- DELIN: Annual delivery cost

Template Use – Loading the Templates into ANSWER

The 'Import Model Data from Excel' dialog box contains the following information:

Excel Files to be Imported:

- C:\VRG\elQC2\SEE-REMS\Task1\RESets\LoaderTest\3\SEE-REDP_SUP-UPS_Croatia_v3-051007.xls
- C:\VRG\elQC2\SEE-REMS\Task1\RESets\LoaderTest\3\SEE-REDP_AGR_Croatia_v3-051007.xls
- C:\VRG\elQC2\SEE-REMS\Task1\RESets\LoaderTest\3\SEE-REDP_COM_Croatia_v3-051007.xls
- C:\VRG\elQC2\SEE-REMS\Task1\RESets\LoaderTest\3\SEE-REDP_IND_Croatia_v3-051007.xls
- C:\VRG\elQC2\SEE-REMS\Task1\RESets\LoaderTest\3\SEE-REDP_RSD_Croatia_v3-051007.xls

Target Scenario: BASE

Options:

- Strong Checking of TS and TID Data Parameters
- Merge/Overwrite information in the Target Scenario with that on Sheets being Imported
- Before Import, Delete information in the Target Scenario for Items on Declaration Sheets
- Before Import, Delete All Information in the Target Scenario for Region(s) being Imported
- Use LIFE to set RESID where just first period RESID
- Set IBOND(FX) = 0 where RESID specified
- Ignore Technology where first period RESID = 0
- Create Compulsory Commodity, Technology Parameters

Additional Options:

- Prompt user to decide whether to Import, for each Excel File that has errors
- Import only from Excel Files that are error-free, without prompting
- Import error-free records from all Excel Files, without prompting