**ANSWER-MARKAL update**

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**Main ANSWER-MARKAL Enhancements 2006-2008: 1**

- **ANSWER-MARKAL presentation at ETSAP Meeting Cape Town South Africa, June 2006 focussed on following enhancements:**
  - Technology Items Filters
  - “Rule-based” Constraints

- **By Sept. 2006, with the release of ANSWER-MARKAL version 6.1.9, the following significant enhancements became available:**
  - Flexible TimeSlice version of ANSWER-MARKAL, to handle introduction of flexible timeslicing into GAMS MARKAL code
  - ANSWER-MARKAL “smart” load templates facility, version 5

- **Significant contribution by Gary Goldstein, IRG USA, plus US EPA funding support to Noble-Soft Systems via US EPA project with IRG**
Main ANSWER-MARKAL Enhancements 2006-2008: 2

◆ ANSWER-MARKAL version 6.2.15 released August 2007:
  ➢ New AnswerV6.exe supporting GAMS-MARKAL code, version 5.7d, including support for more detailed reporting of results in tables T04, T06, T08 and T25
  ➢ Multi-select for Delete of Cases from Cases listview (Home Screen, bottom LHS), including very efficient “Delete All Cases” (Remember Case Definitions)
  ➢ Run Model handling of error situations improved so easier for user
  ➢ New version of the ANSWER-MARKAL “smart” spreadsheets, ANSWERver6.1.xls, extended to allow specification of declaration information and data for Taxes/Subsidies
  ➢ New and completely up-to-date ANSWERv6-MARKAL User Manual
  ➢ Completely up-to-date ANSWERv6-MARKAL Load Templates Manual
  ➢ New Help menu items to allow user to bring up PDF of the ANSWERv6-MARKAL User Manual and ANSWERv6-MARKAL Load Templates Manual

Main ANSWER-MARKAL Enhancements 2006-2008: 3

◆ ANSWER-MARKAL version 6.2.23 released October 2008:
  ➢ New AnswerV6.exe supporting GAMS-MARKAL code, version 5.7g
  ➢ Otherwise primarily minor enhancements and a few bug fixes
Main ANSWER-MARKAL Enhancements 2009 so far

- ANSWER-MARKAL version 6.2.30 released March 2009:
  - New AnswerV6.exe supporting GAMS-MARKAL code, version 5.8a
  - ANSWER automatically opens ANSWER-MARKAL database that user was most recently working with
  - Two new menu items allow user to Add New Time Periods to / Delete Time Periods from their existing ANSWER-MARKAL database (adapting Visual Basic code for same facilities in ANSWER-TIMES):
    - New “Technology Filters on Parameter Tab” facility allows use of Technology Filters to filter TS & TID Data and Results on Parameter tab:
ANSWER-MARKAL Developments, remainder of 2009 - 1

◆ New MARKAL extension to permit modeling of Lumpy Retirements
  ➢ In 2003 ABARE (Ken Noble) enhanced GAMS MARKAL code and ANSWER-MARKAL to permit modeling of Lumpy Investments
  ➢ Recently at request of Intelligent Energy Systems (IES) Sydney, Noble-Soft Systems has enhanced GAMS MARKAL code and ANSWER-MARKAL to permit modeling of Lumpy Retirements
  ➢ IES whose Australian MARKAL model is at individual power station level have tested and are pleased with more meaningful results obtained

◆ Alternative “new” simplified format for ITEMS data in Excel load templates used for “Import Model Data from Excel”
  ➢ Including addition of “smart” buttons to new simplified ITEMS, TS DATA, TID DATA sheets (creating alternative “smart” load template format)

◆ Incorporate Library region approach into version 6 of ANSWER-MARKAL
  ➢ International Energy Agency’s ETP Model

ANSWER-MARKAL Developments, remainder of 2009 - 2

◆ Introduce “New Case”, “Edit Case” functions to facilitate user creation, modification of Cases with no need to use “Run Model” form
  ➢ To also be available in association with Batch Run facilities

◆ Review “Import Model Data from Excel”, “Run Model”, “Import Results” facilities with the aim of speeding up when used for very large models

◆ Enhance facilities for handling Bilateral Trade (BiTrade tab)
  ➢ Adapt ANSWER-TIMES’ Trade Process facilities?

◆ Bring ANSWER-MARKAL User Manual up-to-date