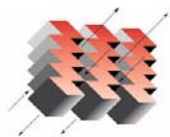


REM/Rate™

The Home Energy Rating Tool

Advanced User's Workshop

V. Robert Salcido, P.E., LEED AP
Architectural Energy Corporation



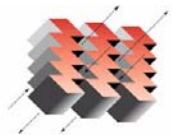
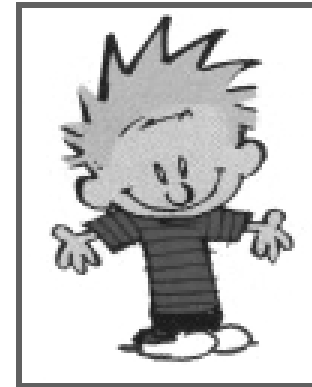
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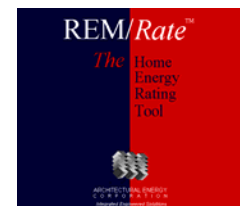


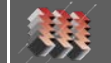
Introduction

- Me
 - Product manager
 - Involved 10+ years
 - Engineer, software developer
- You
 - Experience with REM/Rate?
 - Why are you here?



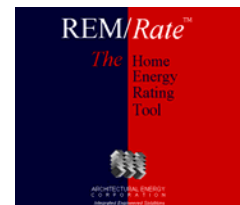
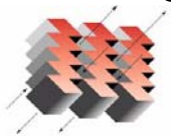
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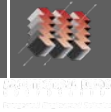
Overview

- Analysis
- Data output
- Technical
- Library management
- Tricks
- Options
- General discussion



Analysis

- Improvement Analysis
 - Automatically analyzes the impact of multiple improvement measures
 - Ranks measures by economic performance using costs defined by user
 - Add measures on the fly
 - Measures can be “packaged”



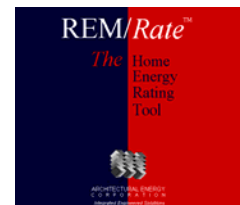
Analysis

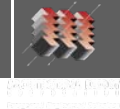
- User-Defined Reference Home
 - Create custom reference homes
 - Local codes, utility program baseline
 - Uses text file w/ scripting language
 - Example provided w/ software: m92bstn.ubr
 - Start w/ copy of example, retain *.ubr extension
 - Extensive documentation in help system



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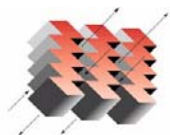
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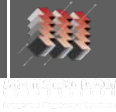
Analysis

- Batching
 - Building file modifications (File menu)
 - Results (Reports menu)
 - Batch report, includes Energy Star, Tax Credit designation, and HERS Index
 - Can generate UDRH and reports
 - Export database
 - Energy Star labels, mailing labels



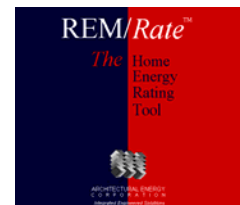
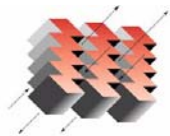
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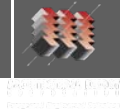




Analysis

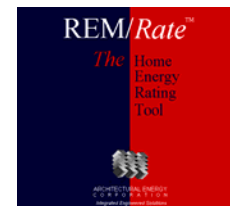
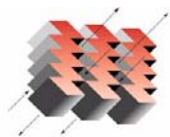
- Using batch/UDRH/export/queries to evaluate program-wide savings
 - Very powerful method of evaluating program performance
 - Requires some experience w/ Access





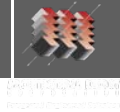
Analysis

- Fannie Mae EEM Report
 - Used to process Energy Efficient Mortgages (EEMs) for new home construction
 - Document designed by Fannie to be compatible with Desktop Underwriting (DU) system
 - Default cost-weighted life of measures makes it very simple
 - Uses HERS Reference home as baseline (new in REM/Rate v12.7)



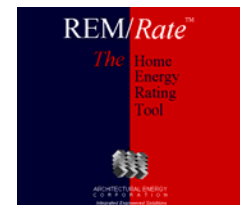
Data Output

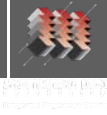
- Multi-building reports
 - Two-building reports for comparison
 - Report list notation
 - (2) = 2-building only
 - (1) = 1-building mode only
 - Economic Summary
 - Examine/compare to reference homes for HERS, IECC, etc.



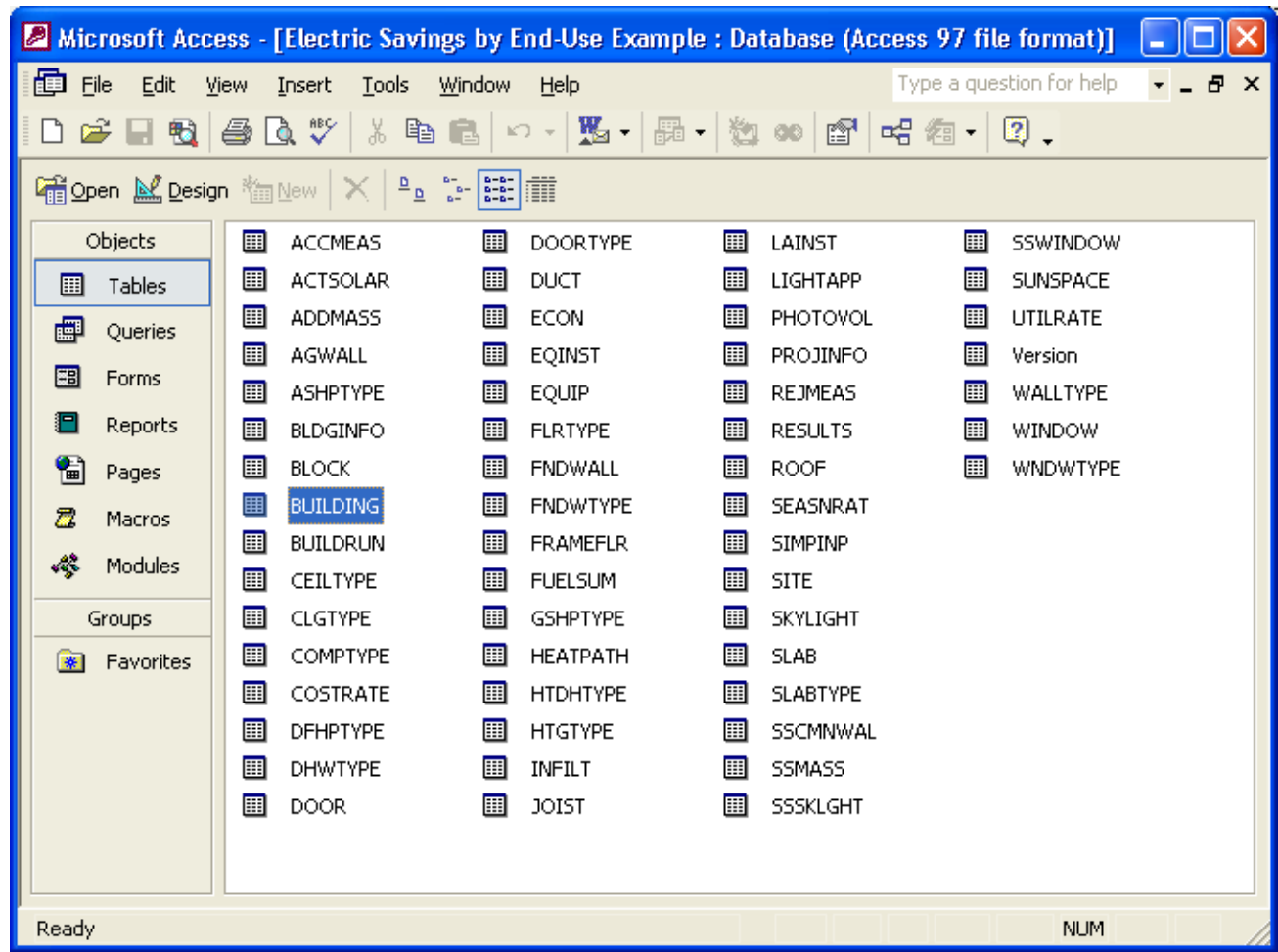
Data Output

- Export Database
 - Access or SQL relational database
 - All input, nearly all output
 - Use for archiving, data mining (w/ queries)
 - Reference homes can be exported
 - Extensive documentation on Help menu





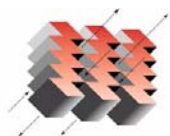
Data Output

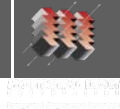


Data Output

SBURATENO	Therms - Heating	kWh - Heating	kWh - Cooling	Therms - Water	kWh - Water	Cooling Peak Btuh	SEER	EER
003-00543		6162	1586		5691	37344	14	

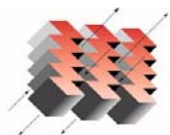
Building Name	Electric Savings (kWh)	Gas Savings (Therms)	Oil Savings (Therms)	LP Savings (Therms)	Reference Pk Clg (kBtuh)	Qualifying Pk Clg (kBtuh)	Reference Pk Htg (kBtuh)	Qualifying Pk Htg (kBtuh)	HERS Score
052401-090-04-dowdell.blg	4195	765			51.70	37.92	83.69	65.95	88.20

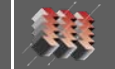




Data Output

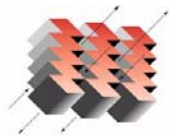
- CSV
 - Comma-separated variable
 - Imports into Excel
 - Single building results
 - Same file name as building file, csv extension
 - Toggle on/off on Options menu
 - Batch
 - Called batch.csv
 - Always generated





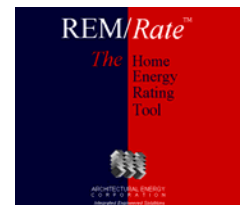
Data Output

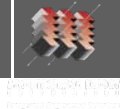
- Report grouping
 - Select multiple reports quickly
 - Can be defined by user



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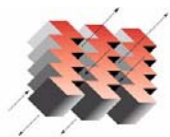
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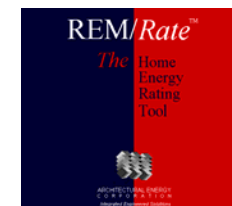
Data Output

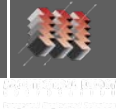
- Customizing reports w/ graphics
 - Add logo to reports
 - Top of page or watermark
 - Use Options menu to access setup screen



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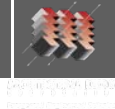
Integrated Engineered Solutions





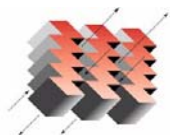
Data Output

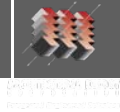
- Graphs
 - Quick, easy to use
 - Track impact of changes in building design
 - Use for client education/explanation



Technical

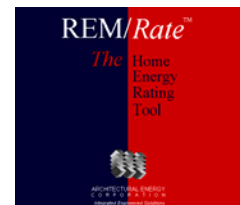
- Input data restrictions for HERS Index
 - Setpoints
 - Always 68/78
 - Shading
 - Only overhangs affect score
 - Interior and adjacent overridden
 - Infiltration
 - Minimum 0.35ach
 - Can go lower w/ mechanical ventilation

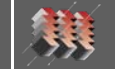




Technical

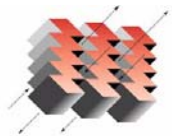
- Conditioned vs. Unconditioned Basements
 - Conditioned - setpoint is maintained, directly or indirectly. To include in conditioned floor area based on finished or unfinished.
 - Unconditioned - temperature calculated based on connections to conditioned/ambient, gain from ducts, equipment; generally floats 5 - 10 degrees lower than setpoint.
- Conditioned crawls/attics
 - Include the volume, not the area





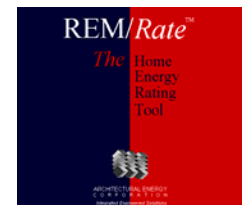
Technical

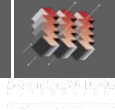
- Utility rates
 - Seasonal
 - Block rates



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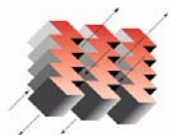
Integrated Engineered Solutions

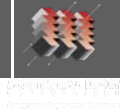




Technical

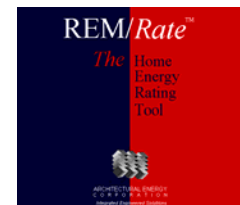
- Integrated space/water heating systems
 - Boiler w/ side arm tank
 - Two systems: space heating, water heating
 - Use boiler AFUE for tank recovery efficiency
 - Set tank EF = $0.75 * AFUE$
 - DHW tank serving space heating coils
 - Two systems: space heating, water heating
 - Use tank recovery efficiency for space AFUE

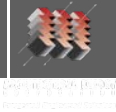




Technical

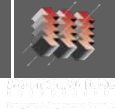
- GSHPs – REM model vs vendor values
 - To use REM model, use single entry from GSHP library
 - To use vendor calculated seasonal efficiencies, use entries from heating only and cooling only libraries
 - REM model has fixed assumptions regarding soil characteristics





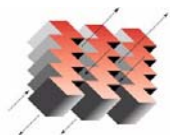
Library Management

- Message when opening building files
 - Be careful not to change building file
 - Can always clean libraries later



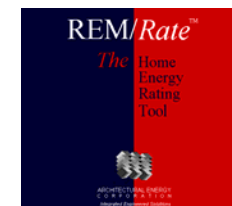
Library Management

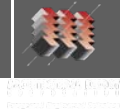
- Transfer files
 - Easy way to share file entries
 - Select which entries



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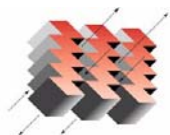
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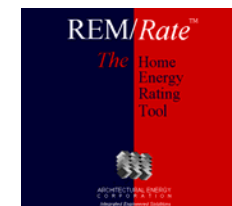
Library Management

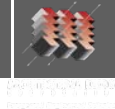
- Library sets
 - Serves two purposes:
 - Sharing on a central server
 - Locking and shipping for consistency
 - Two levels of locking: set, entries



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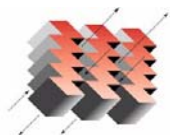
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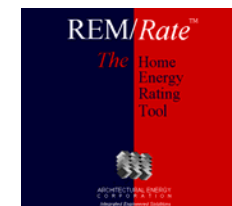
Library Management

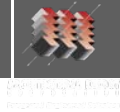
- Sorting libraries
 - Up/down arrows
 - Faux entries for categorizing
 - E.g., “----- SIPs -----”



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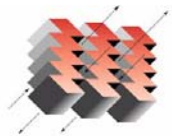
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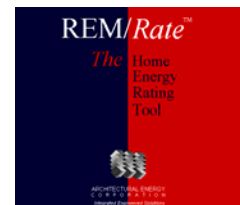
Tricks

- Keyboard shortcuts
 - Equation solver in fields
 - All numeric inputs
 - Using Tab key to speed entry
 - Using <alt> key to access menus



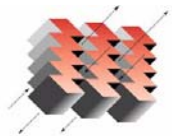
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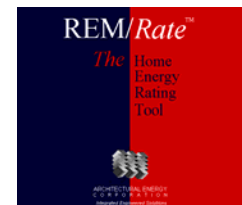


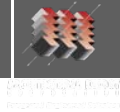
Tricks

- Default building
 - On File menu
 - Lets you save/use partially filled out building
 - Your company name, etc.



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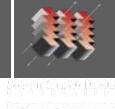


Tricks

- Rotate windows/skylights
 - Rotate manually
 - Determine worst-case orientation
 - HERS score, energy costs, design loads

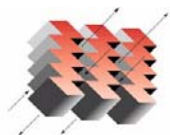
Tricks

- Web Services
 - Registration
 - ID/PW must be exact, use copy/paste
 - Need to re-register annually or semi-annually to advance expiration date
 - Downloading print permissions
 - Also done during registration



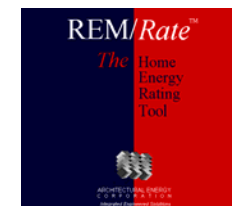
Options Menu

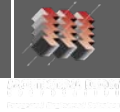
- Oversize factors
 - For equipment sizing report
 - 100% = multiplier of 1.0



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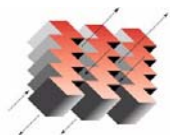
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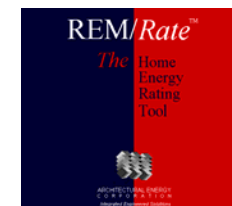
Options Menu

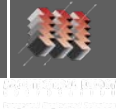
- Binding adjustments
 - Slide text over on printed reports to allow for binding



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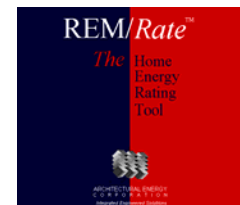
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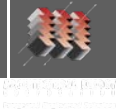




Options Menu

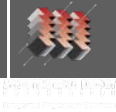
- Home energy rating certificate
 - HERS provider address
 - Appears in lower right corner
 - Criteria program check
 - Check if home meets energy codes imbedded in software
 - Disable regional criteria screen
 - Add program/regional criteria, check manually
 - Add signature line to report
 - For rater/provider to sign





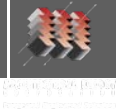
Options Menu

- IECC Toggles
 - Standard Design SEER
 - Applies only to 2003 and prior codes
 - Set to SEER 10 or 13, shows on reports
 - DOE and IECC disagree
 - 2006 Duct Requirement
 - Provides for relaxation of mandatory R-8 to R-6
 - Declared on 2006 IECC reports



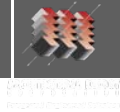
Options Menu

- Tax Credit Methodology
 - RESNET 05-001 or 06-001
 - Either is accepted by IRS
 - Try both, use to your advantage
 - Normalized Consumption vs nMEUL
 - Numbers don't have much meaning outside tax credit



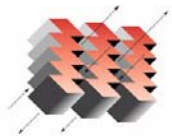
Options Menu

- Energy Star certificate
 - Add rating score to certificate/label
 - Include border on certificate
 - Adjust printing offset for label



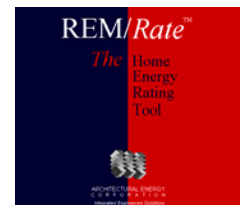
Options Menu

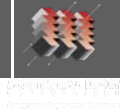
- Building Input Mode Default
 - Selecting mode will bypass question when starting a new building



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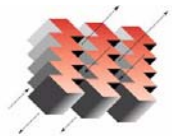
Integrated Engineered Solutions





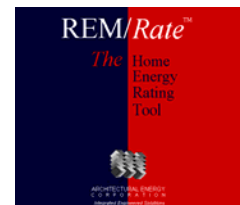
Options Menu

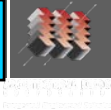
- Enable output results file
 - Comma-separated variable (csv) format
 - One file for each building file run
 - Same name as building file, *.csv
 - Toggle on/off



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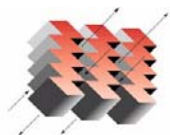
Integrated Engineered Solutions





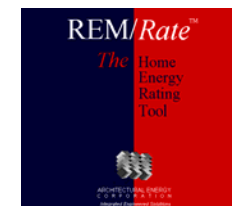
REM/Rate v12.7

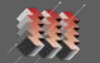
- Projected release in April, 2009!
 - IECC 2009
 - New Reporting



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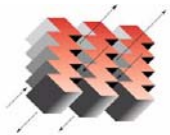
Integrated Engineered Solutions





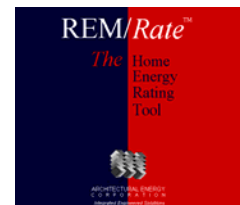
Discussion

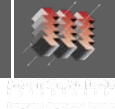
- Questions?
 - Technical?
 - Features?
- Suggestions
 - New features
 - This curriculum



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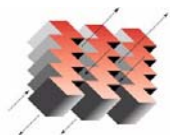


REM/*Rate*TM

The Home Energy Rating Tool

Thank You!

V. Robert Salcido, P.E., LEED AP
Architectural Energy Corporation



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