

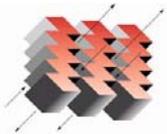
REM/Rate™

Home Energy Rating Software

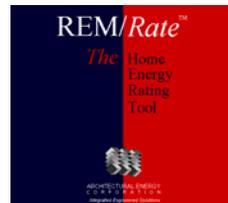
Advanced User's Workshop

David R. Roberts, P.E.

Architectural Energy Corporation

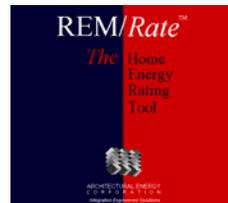
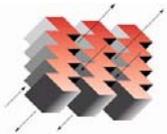


ARCHITECTURAL ENERGY
CORPORATION
Integrated Engineered Solutions



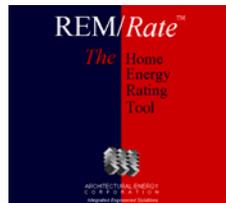
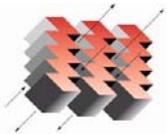
Introduction

- Me
 - Product manager
 - Involved 14+ years
 - Engineer, software developer
- You
 - Why are you here?
 - Experience with REM/Rate?



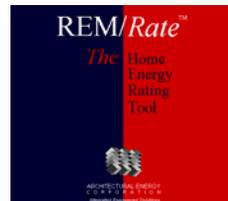
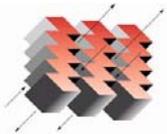
Overview

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



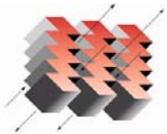
Analysis

- 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”



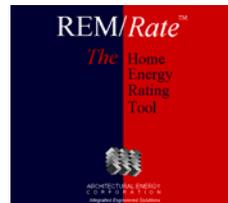
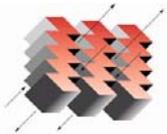
Analysis

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



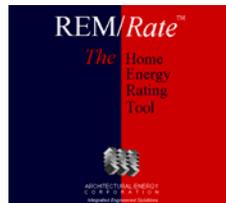
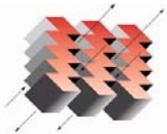
Analysis

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



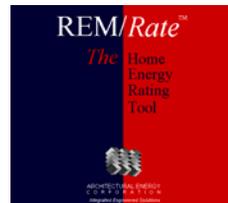
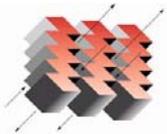
Analysis

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



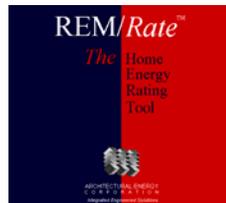
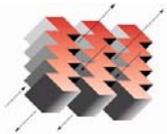
Analysis

- 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
 - Use 1993 MEC if no local code



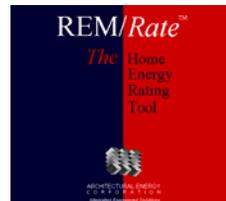
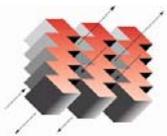
Data Output

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



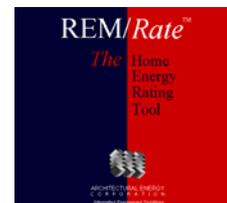
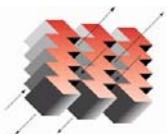
Data Output – Export DB

Window-to-Wall Area Ratio	<= 0.12	> 0.12 and <= 0.15	> 0.15 and <= 0.18	> 0.18 and <= 0.20	> 0.20
	67.16	23.88	5.97	1.49	1.49

Ceiling R-Value	< R19	= R19	> R19 and < R30	= R30	> R30 and < R38	= R38	> R38
	0.00	0.00	0.00	24.00	0.00	66.67	9.33

Cooling SEER	<= 10	> 10 and < 12	= 12	> 12
	50.00	25.76	9.09	15.15

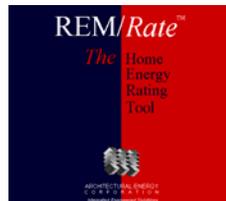
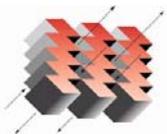
HERS Rating	< 70	>= 70 and < 80	>= 80 and < 83	>= 83 and < 86	>= 86 and < 88	>= 88 and < 90	> 90
	0.00	1.49	11.94	52.24	28.36	5.97	0.00



Data Output – Export DB

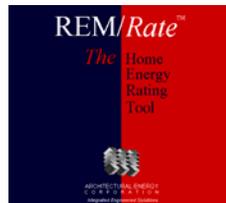
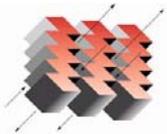
SBURATENO	Therms - Heating	kWh - Heating	kWh - Cooling	Therms - Water	kWh - Water	Cooling Peak Btuh	SEER	EER
003-00543		6162	1586		5691	37344	14	

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



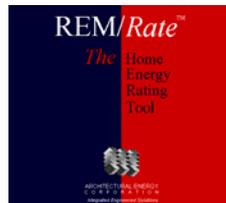
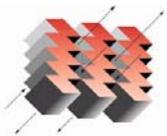
Data Output

- 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



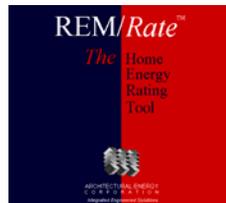
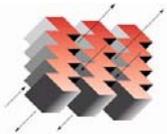
Data Output

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



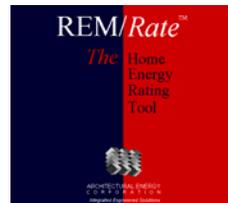
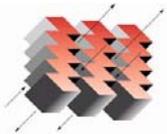
Data Output

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



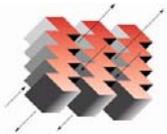
Data Output

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



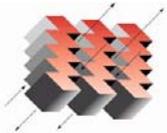
Technical

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



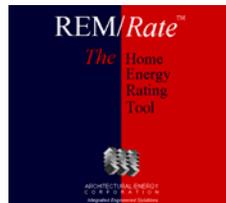
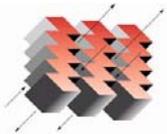
Technical

- Conditioned vs. Unconditioned Basements
 - Conditioned - setpoint is maintained
 - 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



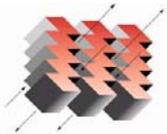
Technical

- Utility rates
 - Seasonal
 - Block rates



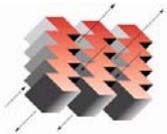
Technical

- 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 * recovery efficiency
 - DHW tank serving space heating coils
 - Two systems: space heating, water heating
 - Use tank recovery efficiency for space AFUE



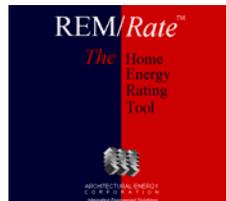
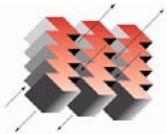
Technical

- 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



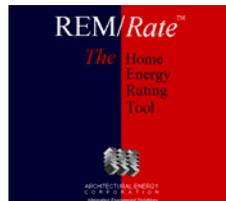
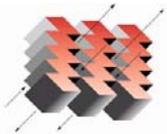
Library management

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



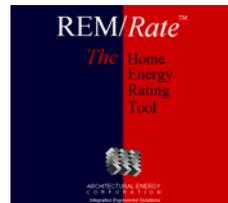
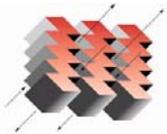
Library management

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



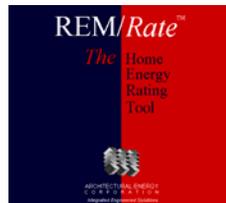
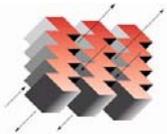
Library management

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



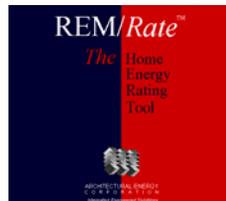
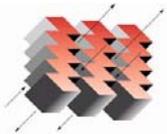
Library management

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



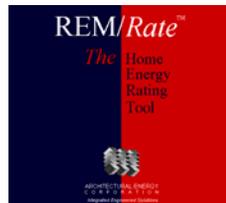
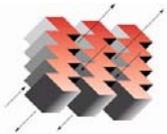
Tricks

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



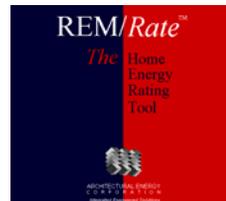
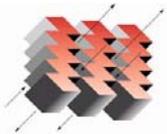
Tricks

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



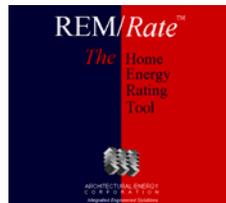
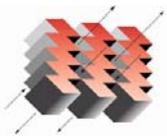
Options menu

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



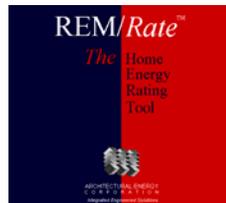
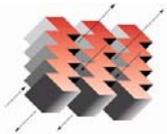
Options menu

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



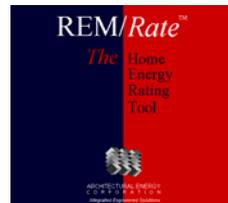
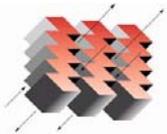
Options menu

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



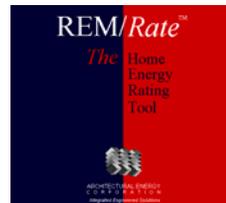
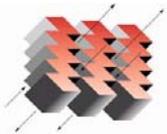
Options menu

- Logos in reports
 - Already covered
- Binding adjustments
 - Slide text over on printed reports to allow for binding



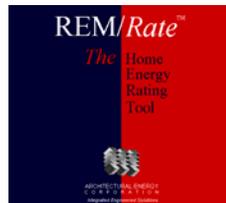
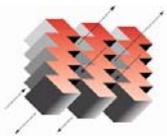
Options menu

- 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



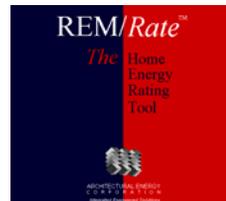
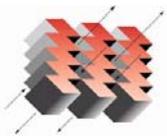
Options menu

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



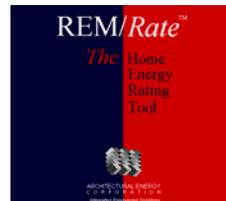
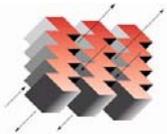
Options menu

- 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



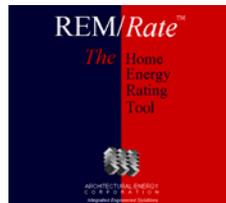
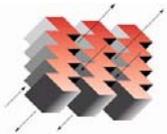
REM/Rate v12.1

- Expected release date 3/10
- Finalized tax credit report
- 2006 IECC compliance reports
- Energy Star thermal bypass checklist
- Batch file modification: lights/appliances
- Improved menus



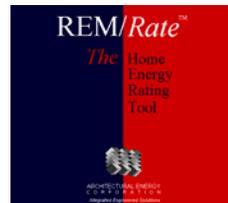
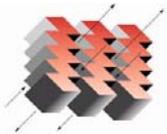
REM/Rate v12.2

- Expected release Spring 2006
- Wrightsoft RSR export/import
- LEED for Homes checklist
- New print previewer



General Discussion

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



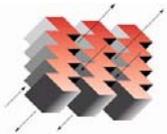
REM/Rate™

Home Energy Rating Software

Thank you!

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Architectural Energy Corporation



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