

Maryland ENERGY STAR[®] for New Homes Programs



**A CASE STUDY IN 2012 IECC CODE
COMPLIANCE**

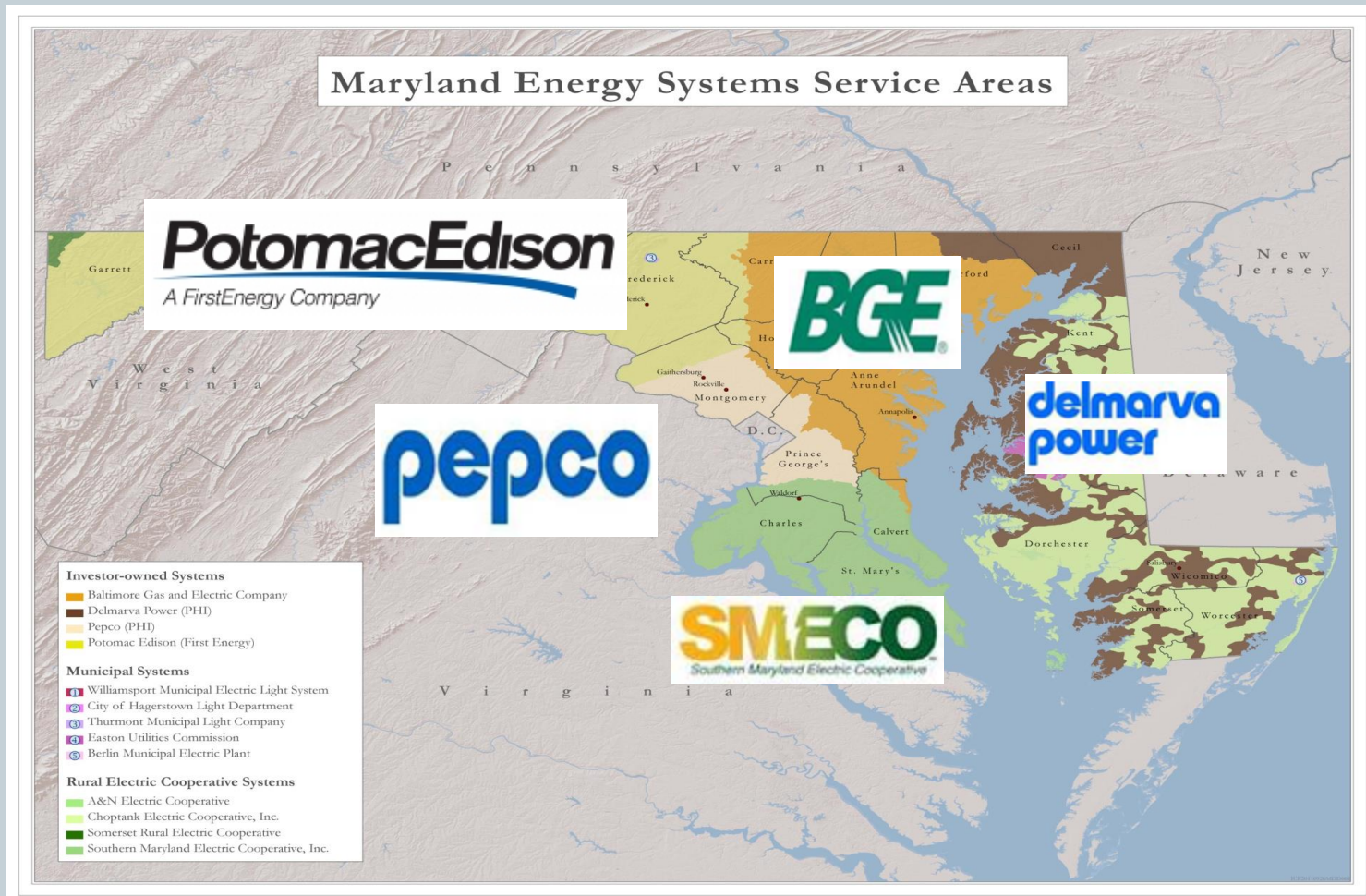
**THROUGH THE TITLES AND
LYRICS OF SOME GREAT SONGS**

Getting Started



- **EmPower Maryland Act: The driving force**
 - 2008 legislation
 - 15% reduction in per capita electricity consumption and 15% reduction in per capita peak demand by 2015, compared to 2007 baseline
 - All Maryland utilities required to develop EE and DR programs
 - Programs are funded through public benefit charge to each consumer

The State of Maryland



Outline



- What is this 2012 code you speak of?
 - David Bowie
- Methodology: AKA how things work on paper
 - Hip/Hop & Rap
- Code: builders perspective
 - Rolling Stones
- Code: code inspectors perspective
 - Country Hits
- Code: utility's perspective
 - Disco/Dance
- Execution and lessons learned
 - Motown

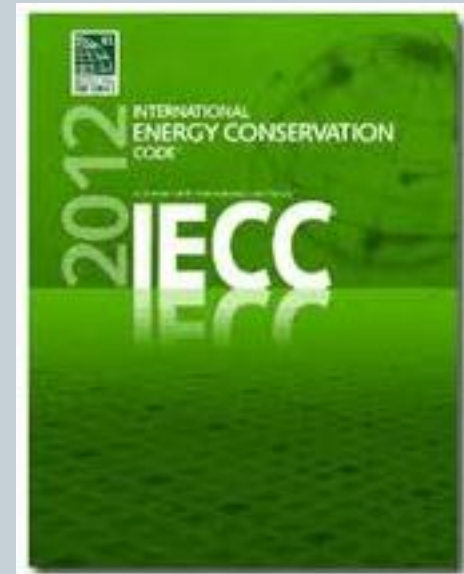
2012 Code



**TIME TO MAKE A
CHANGE –
DAVID BOWIE**

Under Pressure

- 2012 code adopted by Maryland
 - Required for all homes permitted after July 1st 2012
 - Significant changes to the shell of the house
 - Insignificant changes to everything else



Changes



Input	2009 IECC Code	2012 IECC Code
Wall Insulation	R-13	R-20*
Ceiling Insulation	R-38	R-49*
Infiltration	7 ACH50*	3 ACH50
Duct Leakage	10 CFM25 per 100 square feet*	4 CFM25 per 100 square feet*
CFL's	50% CFL's*	75% CFL's

* Means.... not really

Rebel Rebel



- **2009 allowances**
 - Infiltration rate and duct leakage can be estimated by visual inspection
 - 50% CFL's can be offset by higher efficiency in other equipment
- **2012 allowances**
 - Wall insulation can also be R-13 + R-5 continuous
 - 2012 attic insulation can be R-38 if raised heel trusses are used
 - A duct test doesn't have to be done if the ducts are completely in conditioned space

Study Methodology



**CAN YOU DIG IT?
WE CAN DIG IT!-
TAG TEAM**

Can I Kick It?



- Maryland has 25 counties
 - 16 of which have electric power
- Statistics required the need for varying numbers of homes from each county
 - 1 home for 12 counties, as much as 10 in other
- In total, need to provide information on 67 homes across the state

Blurred Lines

- **Survey builders**
 - Are you doing code?
Everything, awesome
- **Survey Code officials**
 - Are you enforcing code?
Awesome
- **On site inspection**
 - Perfect



Hey Ya!



- On site inspection of 67 homes
- Work without code inspectors
- Key inputs:
 - Insulation
 - CFL's
 - Windows
 - HVAC System
 - Infiltration
 - Duct Leakage

Maryland New Homes Programs - 2012 Code Compliance Baseline Study										
Builder:					Lot #:					
Community:										
Street Address:					County:					
House Type:		<input type="checkbox"/> SFD		<input type="checkbox"/> Townhouse		<input type="checkbox"/> Two on Two Condo				
Foundation:		<input type="checkbox"/> Basement		<input type="checkbox"/> Slab		<input type="checkbox"/> Crawlspace				
Area:					Volume:					
# of Bedrooms:					Ventilation Rate:					
Whole House Air Infiltration:					CFM @ 50 Pa		Fan PR:		RING:	
HVAC SYSTEM # 1					HVAC SYSTEM # 2					
Location Served:					Location Served:					
Area of Zone:					Area of Zone:					
Brand:					Brand:					
Furnace/HP Model #:					Furnace/HP Model #:					
Programmable T-Stat?		<input type="checkbox"/> Yes		<input type="checkbox"/> No		Programmable T-Stat?		<input type="checkbox"/> Yes		<input type="checkbox"/> No
Input BTU						Input BTU				
Output BTU						Output BTU				
Coil Model #:						Coil Model #:				
Condensor Model #:						Condensor Model #:				
A/C SEER:						A/C SEER:				
Total Duct Leakage:						Total Duct Leakage:				
Leakage to Outside:						Leakage to Outside:				
% of Duct Outside:						% of Duct Outside:				
Duct R-Value:						Duct R-Value:				
Above Grade Wall Insulation Value:					RESNET Grade:					
Below Grade Wall Insulation Value:					RESNET Grade:					
Attic Insulation Value:					RESNET Grade:					
Hot Water Brand:		Model:		Size:		Fuel:				
Windows		U-Factor:		SHGC:		Glazing Sq/Ft:				
		Manufacturer:				Model:				
Lighting		Fixture #:		CFL #:						
Notes:										

Builders Reaction to Code



**YOU CAN'T ALWAYS GET
WHAT YOU WANT—
ROLLING STONES**

Sympathy for the Devil

- Increased costs on foundation, framing, insulation, design, air sealing, verification
- Imagine a better power point
 - That costs 15% more
 - That of your staff of 50 people, 20 would be doing something different
 - That 95% of consumers couldn't tell a difference



Tumbling Dice



- Builders pulled permits prior to July 1st, 2012
- Builders built homes starting in June of 2012 that are still specked out
- Builders plead ignorance to code changes
- HVAC contractors “verify” duct tightness
- New rounding rules for math set by counties

Code officials reaction to code



**YOU CAN TAKE THIS JOB
AND SHOVE IT—
JOHNNY PAYCHECK**

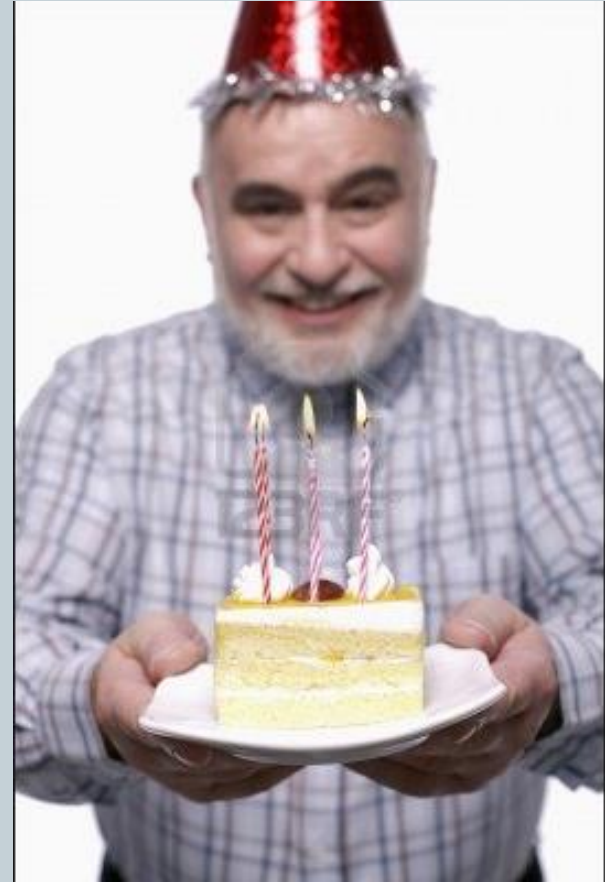
Before He Cheats

- More options means more confusion
- Made up terms like CFM25 and ACH50
- Made up gauges like DG 700



Beautiful Mess

- Code officials who don't perform the actual tests
 - Haven't been trained
- Builders don't understand requirements nor like increased costs
- Only happy party... The Rater



My_{ar}land Reaction to Code



**WHY CAN'T WE BE
FRIENDS –
WAR**

We Should Be Dancing

- 2012 averaging 2100 kWh per house in Maryland
- With the addition of 3 new utilities in Maryland varying market penetration metrics between 40 and 55%



Virtual Insanity

- Dropped savings down to 1150 kWh per house
- Dropped builders because can't incur costs
- Dropped builder leads because raters don't have model homes, track checklists



Execution and Lessons Learned



**WHAT'S GOING ON –
MARVIN GAYE**

I Can't Get Next To You



- Call as many as 40 builders daily
- Drive to communities
- Drive out with meter set crews



Ain't Too Proud To Beg



- We're asking them to allow us access to prove they aren't building to code
- Offering training on future houses
- Offering incentives (if they build ENERGY STAR)

Ooh Child Things Are Gonna Get Easier



- We've inspected about 40 of the 67 homes thus far
- Continue to run into trouble due to homes being 2009 code, pushback from corporate offices
- What we've found is varying degrees of code compliance
 - Duct blaster failures
 - Infiltration failures
 - CFL's either 100% or 0%

ABC/Try a Little Tenderness/Payback



- 2012 code is a pain for everyone
- Working in some capacity with code officials would have been easiest
- Having the ability to pay builders for access to the homes would allow for the best payback

Wake Me Up/The End

- Slide 6: Queen and David Bowie
- Slide 7,8: David Bowie
- Slide 9: Tag Team
- Slide 10: A Tribe Called Quest
- Slide 11: Robin Thicke
- Slide 12: Outkast
- Slide 13 -15: Rolling Stones
- Slide 16: Johnny Paycheck
- Slide 17: Carrie Underwood
- Slide 18: Diamond Rio
- Slide 19: War
- Slide 20: Bee Gees
- Slide 21: Jamiroqui
- Slide 22: Marvin Gaye
- Slide 23,24: Temptations
- Slide 25: The Five Stairsteps
- Slide 26: Jackson 5, Otis Redding, James Brown
- Slide 27: Aloe Blacc, The Doors