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Management of Renewable Energy System under different Load Conditions

Team Members:

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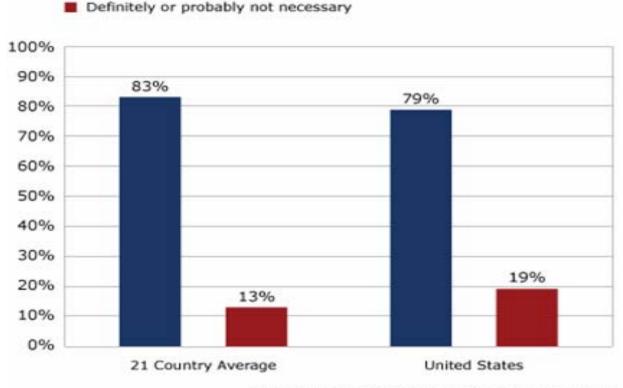
Background

Evolving Energy Systems and Deregulation				
Problems	Constant Increase of Energy Demand			
	High Reliance of Conventional Energy Sources			
	Increase in levels of climate changing gases			

Background

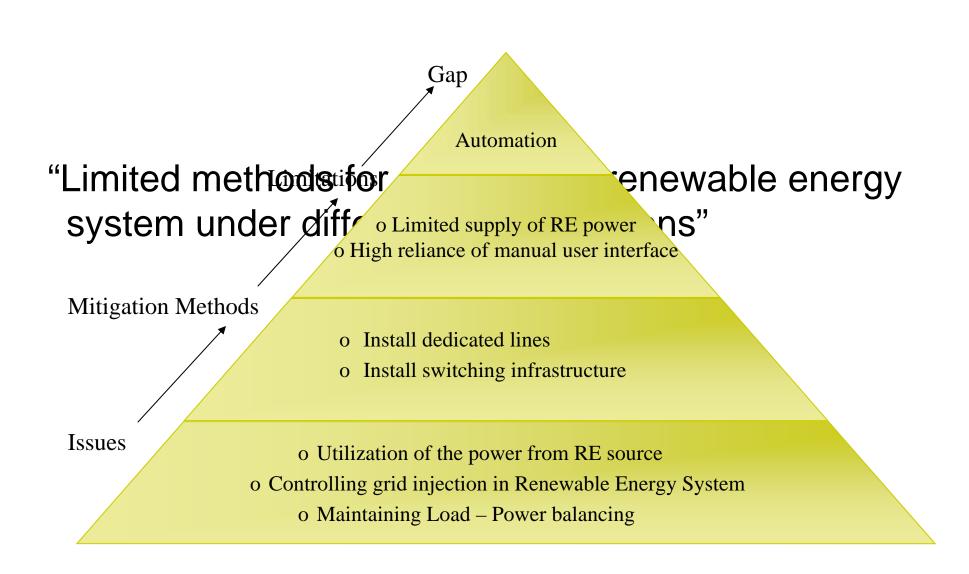
Please tell me how necessary it is for individuals in [country] to make changes in their life style and behavior in order to reduce the amount of climate changing gases they produce.

Definitely or probably necessary



Source: June–July 2007 BBC World Service poll conducted by GlobeScan/Program on International Policy Attitudes.

Problem Statement



Design Requirements

- **Re-configurable**
- □ Stay within project's budget
- **Comply to:**
 - **IEEE 929, 1547**
 - **NEC: 480.9(A) (C), Section 690.74 and Article 110.26**
 - UL 1741 product testing standards

Solution Options

Option 1 GMB HR Module Controller Option 2 PIC 16F877A Controller

Language

Pascal, BASIC, C++

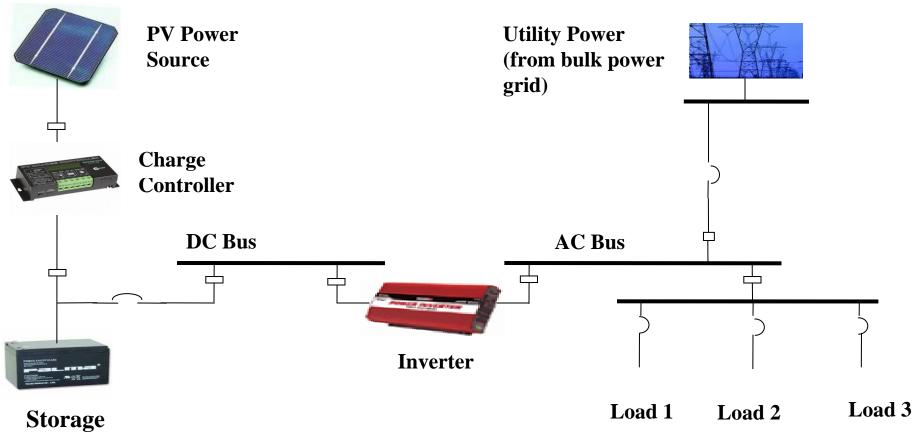
□ Cost = \$450.00

Language

Assembly

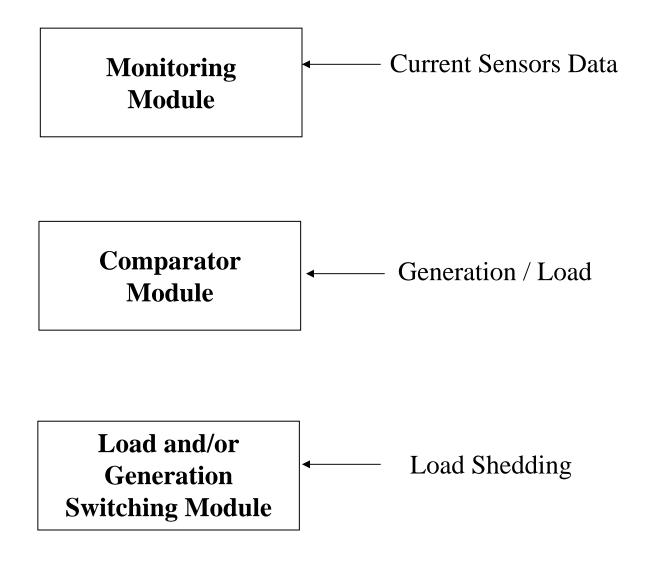
□ Cost = \$80.00

Typical Renewable Energy System

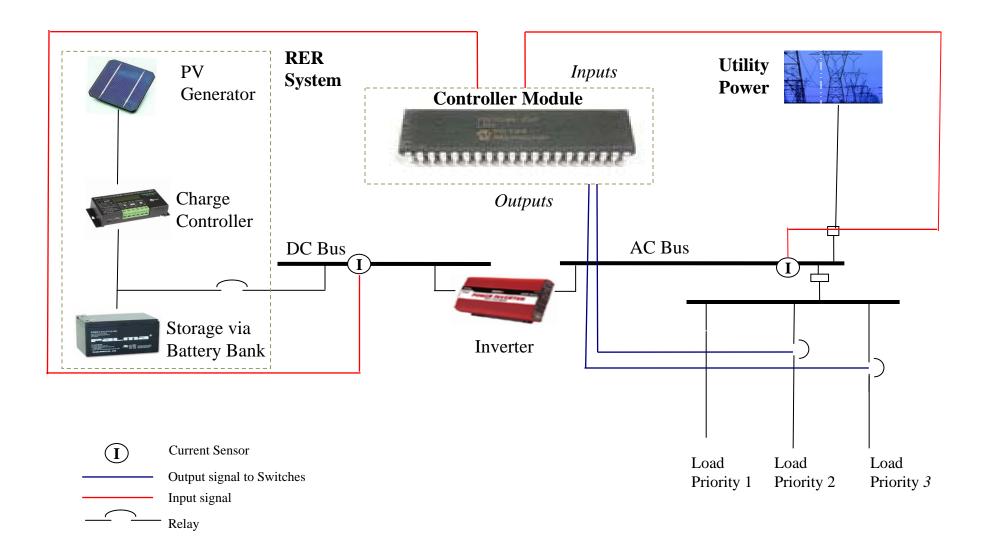


Via Battery

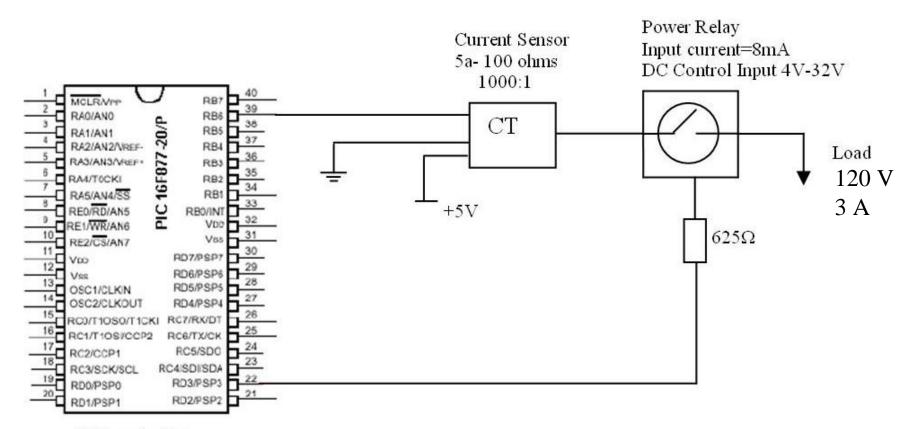
Modular Design



Final Design



Final Design Controller

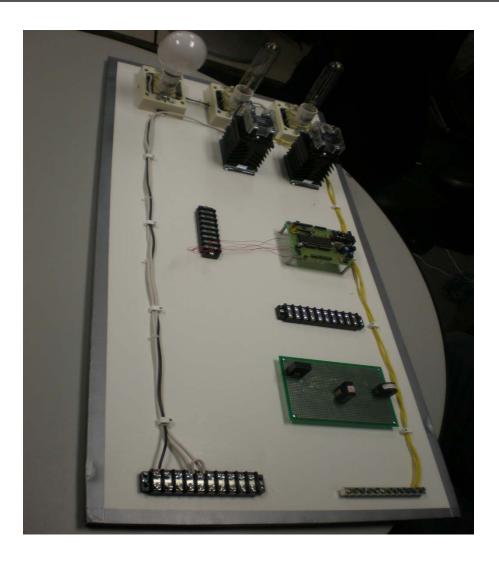


PIC controller Max current sunk by all ports = 200mA Output voltage = +5V

Implementation Methods

- Deriving alternative solutions
- □ Selection of best approach
- □ Hardware sizing
 - Renewable Energy system parts
- □ Selection and Purchase of Hardware and software
- Design Implementation
- □ Troubleshooting unforeseen hurdles

Implementation Design



Basic Layout of Parts

oRelay

oSensors

oMicrocontroller

oLoad Unit Connection

Implementation Plan Timeline

Date	Abdoulaye Sy	Kalifa Llewellyn	Emmanuel Ekatah	Opeyemi Liadi	
7 th Jan – 11 th Jan	Planning of activities for design project				
14 th Jan – 20 th Jan	Derive alternative solutions		System sizing		
21 st Jan – 5 st Mar	Analyze data sheets				
4 th Feb – 15 th Feb	Project review – alternative solutions				
18 th Feb – 25 th Feb	Parts selection		Analyze data sheets		
25 th Feb – 14 th Mar	Order parts				
15 th Mar -19 th Mar	Research PIC controller		Write code for switching logic	Test PIC microprocessor	
20 th Mar – 23 rd Mar	Integrate PIC with power system		Test of Prototype		
24 th Mar – 28 th Mar	Troubleshoot		Monitor Prototype		
31 st March	Completed Design prototype				
17 th April	Final presentation on ECE day				

Conclusion

- Room for increase functionality
- We look forward to the demonstration

Lessons Learned

- Team Work
- Time Management
- Problem Solving Skills

Acknowledgement

- Department of Electrical & Computer Engineering
- Senior Design Coordinator
- CESaC Dr. Momoh, Dr. Chuku and Garfield Boswell and staff

