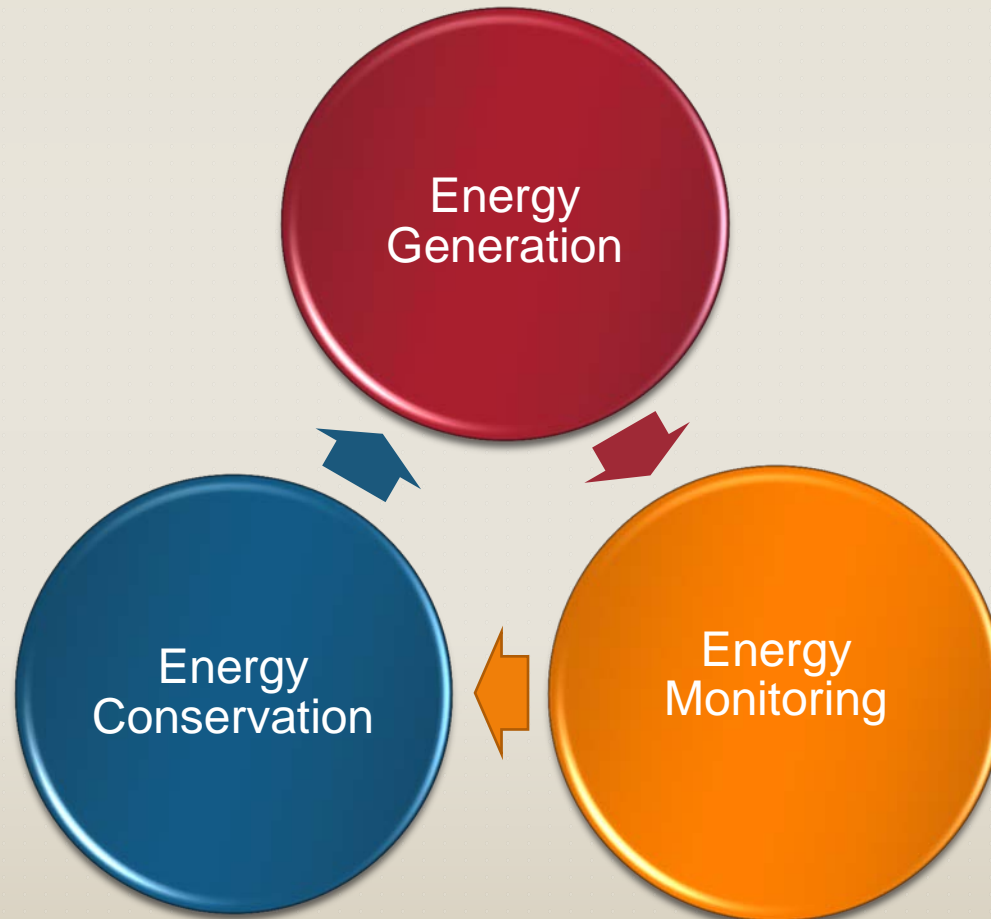


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ENERGY FOR SUSTAINABLE DEVELOPMENT

ANELYA SEGIZBAYEVA
DASH TECHNOLOGY

SUSTAINABLE ENERGY MANAGEMENT CYCLE



OVERVIEW

- ▶ Sustainable Energy Management Cycle
- ▶ Energy Conservation
- ▶ Energy Generation
- ▶ Energy Monitoring
- ▶ DASH Technology Services

ENERGY CONSERVATION - PASSIVE HOUSE

- ▶ What is Passive House?
 - ▶ Rigorous, voluntary standard for energy efficiency in a building, reducing its ecological footprint (Tom Zeller)
 - ▶ Buildings that save energy by design (Passive House Association)
- ▶ First Passive House - Darmstadt, Germany in 1990
- ▶ Passive House Institute (PHI) was founded in September 1996
- ▶ PHI Russia was established in 2008

PASSIVE HOUSE CONCEPT

Key Principles:

- ▶ Insulation
- ▶ Windows
- ▶ Ventilation with heat recovery
- ▶ Airtightness
- ▶ Thermal bridge free design



Passive House, Germany

International Passive House Association
www.passivehouse.com

PASSIVE HOUSE COMPONENTS

▶ **Opaque building envelope**

Wall and construction systems, EnerPHit insulation systems, Floor slab insulation systems, Flue systems, ICF for roof parapets, Balcony connections, Facade anchors

▶ **Transparent building envelope**

Window frames, Frames for fixed glazing, Sliding doors, Curtain wall systems, Inclined curtain wall systems, Roof windows, Skylights, Glazing, Entry doors, Window connections, Roller shutter/external venetian blind

▶ **Building Services**

Ventilation systems (Capacity < 600m³/h), Ventilation systems (Capacity > 600m³/h), Compact heat pump units

IMPLEMENTATION AND COSTS

- ▶ Passive House key principles are the same for all countries worldwide
- ▶ At present - more than 20,000 Passive House units in Central Europe and over 36,000 Worldwide (International Passive House Association, 2012)
- ▶ On average construction of Passive Houses is more expensive than that of conventional buildings (up to 14%)
- ▶ In some countries the price could be the same due to careful design, competition between suppliers and availability of products

PASSIVE HOUSE vs. ACTIVE HOUSE

▶ Active Houses

follow passive design techniques taking them to the next level by producing their own energy, often via photovoltaic panels

▶ Similarities and Differences

- ▶ Both create comfort for occupants while significantly cutting down on energy use
- ▶ Passive House - Natural Elements (Wind and Sun), Building Materials to Achieve Airtightness
- ▶ Active House - Renewable Energy and Automated Controls, Abundance of Windows and Skylights

ENERGY CONSERVATION- RETROFIT

- ▶ Double Glazing
- ▶ Insulation (Walls, Loft, Floor, Doors)
- ▶ LED Lighting and Controls
- ▶ Voltage Optimisation
- ▶ Mechanical Ventilation Heat Recovery
- ▶ Under Floor Heating
- ▶ Fan Assisted Storage Heaters
- ▶ Energy Efficient Boilers



ENERGY GENERATION

▶ Renewable Energy (RE)

is energy that comes from resources which are continually replenished such as sunlight, wind, rain, tides, waves and geothermal heat

▶ World Production and Growth of RE :

- Estimated 19% of global final energy consumption in 2011 came from RE sources
- In 2012 RE accounted for almost 70% of new electric generation in European Union
- Total renewable power capacity worldwide exceeded 1,470 GW in 2012, up about 8.5% from 2011

(Renewables 2013, Global Status Report)

RE TARGETS CIS

Share of primary and final energy from renewables, existing in 2010/2011 and targets:				
Country	Primary Energy		Final Energy	
	Share (2010/2011)	Target	Share (2011)	Target
Russia	5.60%			
Belarus	6.50%			
Moldova		20% by 2020		17% by 2020
Ukraine	1.80%	19% by 2030		11% by 2020
Share of electricity production from renewables, existing in 2011 and targets: □				
Country	Share (2011)		Target	
Russia	0.30%		2.5% by 2015 and 4.5% by 2020	
Share of electricity production from renewables, existing in 2011, countries without targets: □				
Kazakhstan	14.00%			
Moldova	2.10%			
Ukraine	5.80%			
Uzbekistan	18.00%			
Other renewable energy targets:				
Kazakhstan	Renewable electricity		1.04 GW by 2020	
Tajikistan	Small-scale hydro		100 MW by 2020	
Ukraine	Solar		10% of energy balance by 2030; 90% annual increase to 2015	

RENEWABLE ENERGY- EXISTING TECHNOLOGIES

- ▶ Solar PV and Solar Thermal
- ▶ Biomass- Boilers (Heating) Biogas (Power) Biofuel (Transportation)
- ▶ Wind Turbines
- ▶ CHP- Combined Heat and Power
- ▶ Hydro Power
- ▶ Wave Power
- ▶ Tidal Power
- ▶ Geothermal Power



RENEWABLE ENERGY - LARGE SCALE

- ▶ **Geothermal and Solar** - The Stillwater Energy Plant in Nevada, USA, Capacity: 59 MW
- ▶ **Hydropower** - Boguchanskaya Hydro Power Plant, Krasnoyarsk, Russia, Capacity: 3,000MW
- ▶ **Wind** - Lori 1 Wind Farm, Armenia, Capacity: 2.64 MW
- ▶ **PV** - Golmud Solar Park, Golmud, Qinghai Province, China, Capacity: 200MW
- ▶ **Biomass** - Połaniec Power Station, Poland, Capacity: 200MW

RENEWABLE ENERGY – LARGE SCALE



RENEWABLE ENERGY - MEDIUM SCALE

- ▶ Industrial / Commercial Sector
- ▶ Schools / Hospitals
- ▶ Agricultural Sector
- ▶ Communities



Google Headquarters, Mountain View, CA

RENEWABLE ENERGY - DOMESTIC SECTOR

- ▶ Renewable Heating – Air to Water Heat Pump, Ground Source Heat Pump, Air to Air Heat Pump, Biomass Boilers
- ▶ Hot Water from Renewable Energy- Solar Thermal, Thermodynamic Panels, Ecocent
- ▶ Renewable Electricity- Solar PV, Small Wind Turbines, Micro CHP

FEED IN TARIFFS

- ▶ Currently around 99 Countries introduced the Feed in Tariff (FIT) policy for the renewable energy generation/export.
- ▶ **Different FIT designs:**
 - Germany
 - UK
 - Australia
 - Czech Republic
 - India
 - Ukraine



ENERGY MONITORING



ENERGY MONITORING

- ▶ Knowing and understanding what power is consumed in real-time helps change behaviours that result in energy savings (Rexel Energy)
- ▶ The purpose of monitoring:
 - ▶ To enable an understanding of the energy consumption data
 - ▶ To identify underlying factors which impact upon consumption
 - ▶ To set appropriate targets that allow to review performance

Monitoring and Targeting Practical Guide, Carbon Trust

- ▶ On average 5% energy cost savings due to effectively implemented monitoring technology

MODERN ENERGY MONITORING TECHNIQUES

- ▶ Energy Monitors for Domestic Properties
- ▶ SMART Metering
- ▶ Real Time Monitoring- Rexel Energy Management System
<http://portal.rexelenergysolutions.com>
- ▶ Commercial Buildings and Facility Management – Building Management System (BMS)
- ▶ Monitoring for Renewable Energy

DASH TECHNOLOGY SUPPORT



Consultation:

- Feasibility Study
- Market Analysis
- Low to Zero Carbon Technology Overview
- Procurement Support
- Site Specific Advice
- Support with Tender Specifications
- Negotiations with Suppliers



Training:

- Renewable Energy Short Training Program - Five Days
- Site Visits – UK / Germany (Wind, Solar, Biomass)
- Solar PV – First Assessment to Commissioning
- Custom Made Training Programs



Project Management:

- Project Scope Development
- Preparation and Design
- Schedule Development
- Project Team Building and Mentoring
- Resource Allocation
- Capital planning requests
- Regular project updates to key stakeholders

DASH TECHNOLOGY

www.dashtechtechnology.co.uk

anndashtechtechnology@gmail.com

Skype: Anelya.Segizbayeva

M: +447538554175

Thank you for your time
Any questions?