economic and other activities, improves the planning and implementation of environmental measures.

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USING OF EMBEDDED SYSTEMS
IN ENVIRONMENTAL TASKS

Currently, due to the large demand of the automated management of various devices and the measurement of various media parameters, there have been proliferated embedded systems (ES) – microprocessor (microcontroller) hardware and software management systems that are intended, as a rule, for functioning in the devices that are controlled directly by them. Such devices can be applied to automatic adjustment and manufacturing control equipment, telecommunications equipment, machines with computer numerical control, automated teller machines, payment terminals, etc.

One of the software development platform for ES is Microsoft .NET Micro Framework. It allows in the development environment Microsoft Visual Studio using the C# programming language to create applications for embedded devices, which are characterized by the minimum weight, size and power consumption as they are placed within more complex equipment. This platform is rather popular because the managed code is created using a high-level language and it simplifies the process and reduces the time of software development.

Some of the application areas of mentioned above systems in the environmental problems:

• collecting and processing of data from sensors located in different equipment, for example, such as used in the renewable energy sector;

• remote monitoring and control of equipment parameters of the industrial and infrastructure facilities;

• building of geographically distributed systems of data collection and processing for monitoring of environmental parameters, and the like.

To test the effectiveness of using ES for solving environmental problems there was developed an automated system for monitoring of the status and operation of solar collector (SC). Key features of this system:

• data collection for the organization of various dependencies of temperature and its differences from time in specific places of SC;

• calculation of energy performance for a predetermined periods and formation of data for charting characterizing energy efficiency of SC;

• monitoring of the current values of equipment parameters.

In solving of presented problems for software implementation, deployment and debugging of software directly on the physical device were used:

- debugging board with the microcontroller of ARM Cortex M architecture;
- computer to which the debugging board was connected;
- installed development tools from Microsoft.

In this, later during stand-alone functioning of the debugging board it is not required to have a computer with an operating system and development environment.

Thus, the ES are rather effective and optimal solutions in particular for problems related to the environment.

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CURRENT ENVIRONMENTAL ISSUES

Top ten environmental issues facing the world today are:

1. Climate Change; 2. Energy; 3. Water; 4. Biodiversity and Land Use; 5. Chemicals, Toxics and Heavy Metals; 6. Air Pollution; 7. Waste Management; 8. Ozone Layer Depletion; 9. Oceans and Fisheries; 10. Deforestation.

The climate is changing. The earth is warming up, and there is now overwhelming scientific consensus that it is happening, and human-induced. With global warming on the increase and species and their habitats on the decrease, chances for ecosystems to adapt naturally are diminishing. Climate change may be one of the greatest threats facing the planet. Recent years show increasing temperatures in various regions, and/or increasing extremities in weather patterns.

Industrialized nations have emitted far more greenhouse gas emissions (even if some developing nations are now increasing theirs);

Rich countries therefore face the biggest responsibility and burden for action to address climate change;

Rich countries therefore must support developing nations adapt-through financing and technology transfer, for example.

In 1988, the Intergovernmental Panel on Climate Change (IPCC) was created by the United Nations Environment Program (UNEP) and the World Meteorological Organization (WMO) to assess the scientific knowledge on global warming. Its first major report in 1990 showed that there was broad international consensus that climate change was human-induced.

The main purposes of this protocol were to:

1. Provide mandatory targets on greenhouse-gas emissions for the world's leading economies all of whom accepted it at the time.

2. Provide flexibility in how countries meet their targets.