INTRODUCTION

In our lives we are surrounded by wood as one of the oldest and most popular material used in wide variety of everyday objects – from the smallest ones to the large decorative pieces of furniture. Besides decorating these objects with various paints and varnishes, wood is a natural material that lives, breathes and works and must be well protected. With the assistance of the European Regional Development Fund, we conducted a project of technological advancement of our manufacturing facility in order to make a large shift towards the use of environmentally friendly materials for final finishing of wooden products and modernization of production technologies based on the exploitation of renewable solar energy. The vision of the project is to improve the quality of our products to perfection, substitute paints and varnishes based on nitro and polyurethane paints with varnishes based on water, reduce emissions of volatile gases, increase energy efficiency of production using renewable energy sources, increase business competitiveness of Croatian SMEs, encourage Croatian entrepreneurs to use incentives from the European Union, successfully market new products to the European market and further encourage domestic consumers to prefer environmentally friendly products over those that are not.

ABOUT THE PROJECT

Modern positive production trends are evolving in the direction of satisfying all requirements for higher environmentally friendly materials and products as well as better protection of the environment set by Croatian and European consumers. The improvement of technological standard of our company will add to the global objective of strengthening the competitiveness of Croatian SME's through investments in new technologies and production methods. This will be done through:

a. replacing finishing materials that we currently use with new eco-friendly finishing materials with better chemical properties for the environment, working conditions and final users of the product
b. introduction of new technologies for achieving higher level of energy efficiency in production.

Implementation of this project will ensure investments in technology and production methods in accordance with best practice in our industry. Substitution of finishing materials based on nitro and polyurethane with eco-friendly finishing materials based on water together with the introduction of Photovoltaic Power Plant and Solar Thermal System will promote 'green economy' and energy efficiency in production processes.

The European Union is made up of 28 Member States who have decided to gradually link together their know-how, resources and destinies. Together, during a period of enlargement of 50 years, they have built a zone of stability, democracy and sustainable development whilst maintaining cultural diversity, tolerance and individual freedoms. The European Union is committed to sharing its achievements and its values with countries and peoples beyond its borders.

Project was co-financed by the European Union form European Regional Development Fund. The contents of this publication are the sole responsibility of ART Ltd.

Project Holder:	**ART Ltd, Sv.Petar 12d, 47250 Duga Resa, CRO**
Project Title:	**ECO-FRAME YOUR ENVIRONMENT - new materials and technology for eco-friendly production of picture frames and wooden furniture**
Contract reference:	**IPA2007/HR/16IPO/001-040435**
Overall value:	**220.943,87 EUR**
EU funds:	**187.537,16 EUR**
Own funds:	**33.406,71 EUR**
Project duration:	**18 months**

For more information visit: www.strukturni fondovi.hr

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ECO-FRAME YOUR ENVIRONMENT

new materials and technology for eco-friendly production of picture frames and wooden furniture

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GENERAL PROJECT INFORMATION

Value:	220.943,87 EUR
Source of financing:	187.537,16 EUR (84,88%) co-financed by European Union from European Regional Development Fund; 33.406,71 EUR (15,22%) financed by ART Ltd
Duration:	18 months: June 20th, 2013 – December 19th, 2014
Priority axis/measure:	1. Priority 2. Strengthening the competitiveness of croatian economy 2. Measure 2.1. Improving business climate
Beneficiary:	ART Ltd, Sv.Petar 12d, 47250 Duga Resa, Croatia
Responsible Authority:	Ministry of Entrepreneurship and Crafts, MEP/MINPO
implemented by:	Central Finance and Contracting Agency, CFCU/SAFU
Project goals:	1. Increased competitiveness of Croatian SME's 2. Introduction of environmentally friendly finishing materials for final finishing of picture frames and wooden furniture 3. Investing in new and advanced production methods that rely on the use of renewable solar energy
Project results:	- Up to 80% substitution of nitro and polyurethane based finishing materials with eco-friendly water based finishing materials - Up to 60% increased energy efficiency in production - Approximately 46.4% reduced annual Co2 emission compared to date from 2011 - Reduced costs and increased speed of production - Increased productivity for 20% and increased competitiveness in domestic and European markets - Created conditions for further sustainable development
Key activities:	- Introduction of a specialized drying chamber for water based finishing materials for wooden products - Introduction of 50kW Photovoltaic Power Plant - Introduction of 3000l litre capacity Solar heating system - Training of technical staff for use of introduced technologies - Dissemination of project
End recipients:	Company employees; local and regional population; local and regional government

PROBLEMS AND SOLUTIONS

Specialized drying chamber for water based paints and varnishes

In accordance with market demand for products with an optimal ratio of high quality and reasonable price it is our goal to continue to increase and ensure competitiveness in relation to imported products as well as to increase the proportion of our production for export. Our company is faced with the problem of satisfying increasingly higher demands for eco-friendly products set by Croatian and European consumers and the requirements of local and regional authorities and population for better environmental protection.
Paints and varnishes based on nitro and poliurethane solvents are under EU regulations 57/548/EEY and 199/45/EC, and their modifications and amendments, classified as hazardous. Therefore, the plan of the European Union is to replace up to 95% nitro and polyurethanes based finishing materials with those of water-based by year 2020, in order to achieve a higher level of energy efficiency and reduce emissions caused by drying of finishing materials on based on nitro and polyurethane.

For this purpose, we conducted a mayor substitution, about 80%, of finishing materials based on nitro and polyurethane, which were up to now mainly used in our production, with new and eco-friendly finishing materials based on water. Such substitution required certain technological modifications of production process. Water evaporates slower than solvents based on nitro and polyurethane which causes problems in classical drying process in open air making the procedure considerably longer and also leading to possible damaging shape deformations of raw wooden products. To eliminate potential negative effects of open air drying process through this project we introduced **specialised drying chamber for automated and mechanically controlled drying conditions** with constant temperature and pressure that also eliminates dust particles from the immediate drying environment. In addition to achieving high quality finishing it will also significantly reduce total time for performing the finishing, from 3 to 10 times in duration. Aforementioned benefits enable a higher quality and faster production which is essential for meeting new product delivery deadlines.

Autonomous photovoltaic power plant and Solar heating system for heating technological water 3000l capacity

The next issue was satisfying requirements for energy efficiency in production. With current daily average of 100kW/h consumption of electricity and existing classical water heating system, with 4800l capacity, planned technological production facility upgrade with introduction of a specialized drying chamber inevitably meant a further increase in energy needs. The solution for this problem was to upgrade the internal energy network with technology that transforms renewable solar energy into electricity and thermal energy that will be directly used in our production processes. On southern roof surfaces of our production facility we installed **50kW Photovoltaic Power Plant and 3000 litre Solar Thermal System** for heating technological water that is used by a classical and vacuum drier and new specialised drying chamber for water based finishing materials. These technological improvements will reduce the need for external power supply and eliminate negative effects of production deadlocks due to external network instabilities. In addition to increasing energy efficiency it will also reduce air pollution caused by smoke generated through conventional methods of heating by burning wooden derivates.