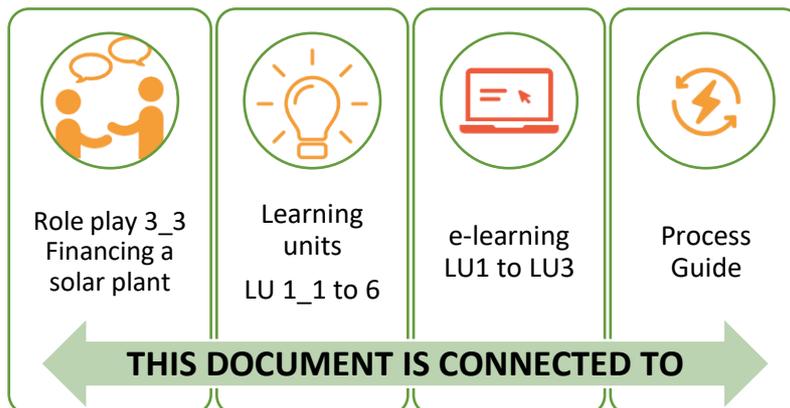




Our Solar Town

Learning Unit 3.3

Solar thermal system_costs



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WERTTOOLS • UMWELT • FÖRDERUNGEN



Co-funded by the
Erasmus+ Programme
of the European Union



Climate Alliance
Austria



Learning Unit 3.3 - Learning Plan

The costs of a solar thermal system

The costs of a solar thermal system depend on many parameters:

- Size of the system
- What kind of collectors are used? (Flat plate collectors, vacuum tube collectors etc.)
- Connection of the solar thermal system to the house installation: Is there a connection to the hot water?
- Where is the heat stored? (Storage tank/drinking water storage tank/combined storage tank)
- Is a storage tank needed? (strongly suggested)
- If there is a storage tank, how far is the distance between it and the solar thermal system?
- Where will the solar thermal system be placed? In-roof/tilt-mounted on the roof/on the ground

To make it easier to find the right answers to all these questions please follow:

- the learning units **LU 3_1 Site selection** and **LU 3_2 Solar thermal system_planning installation** and
- the **Process Guide** of Our Solartown

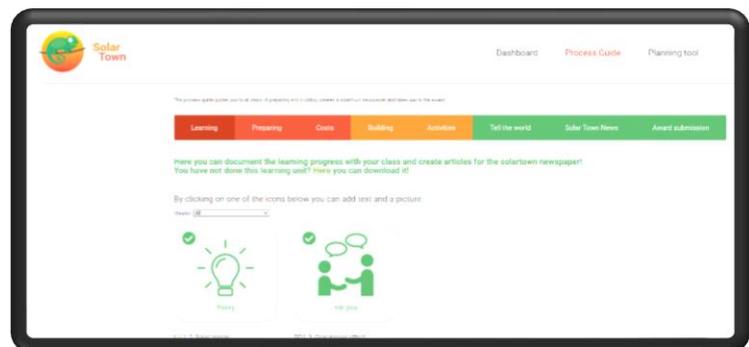
might help you.

You can find the teaching materials and tools on our website: <https://solartown.eu/>.

The **Process Guide** of Our Solartown is an online platform that accompanies the process from planning and construction of a solar thermal system in a school to your project documentation. Moreover, it supports creating a Solartown newspaper and takes you to the submission for the **Our Solartown Award**.

The Process Guide contains following menu points:

- Learning
- **Preparing**
- **Costs**
- Building
- Activities
- Tell the world
- Solartown News
- Award submission



Regarding financing a solar thermal system, the following menus, **Preparing** and **Costs**, are important.

If you need more information about all other menu points in the **Process Guide** please have a look at learning unit **LU 3_2 Solar thermal system_planning installation**.





Preparing:

The page provides all the information that should be considered before building the solar thermal system. With the **Process Guide** is easy to document all your steps and preparations and plan the costs.

You have to take into account the following factors

- Site selection
- Legal aspects
- Obtain permissions
- Materials and costs
- Services and costs
- Tools
- Information (of neighbours and stakeholder)

Site selection

Determine the most suitable place for the installation: more information you can find in **LU 3_1 Site selection**.

The **Planning tool** of “Our Solartown” helps you to find the best spot for the system. Moreover, you can compare different places and buildings.

The planning tool can be found at the following link:

<https://solartown.eu/symfony/public/map/>

Legal aspects

Some legal aspects must be considered, depending on the country (see above). You can find more information in the **Implementation Guide** and the **Guide for Technicians** of “Our Solartown” and in **LU 3_2 Solar thermal system planning installation**.

Obtain Permissions

Before starting the project, you should ask the owner of the building for permission. In most cases, the school is owned by the municipality, but it might be also owned by the provincial or the national government. It would also be relevant to inform the neighbours if the construction will have any impact on their property or themselves.

Materials and costs

Regarding the materials, we recommend buying a “**Do-It-Your-Own-Kit**” because most of the times, it is a cheaper and much easier option to get the needed materials.

In the **Process Guide** you can add the costs of the materials you will have to buy to build the solar thermal system:

- **Do-It-Your-Own-Kit**
(or the sum of the costs of all materials needed)
- **Storage tank** for the hot water (if needed)
- **Expansion tank**
- **Pipes and valves**





If you don't want to use a "DIY-Kid" and want to buy all materials on your own, you can find a list of all materials in the learning units **LU 3_2 Solar thermal system_planning installation** and **LU 5_1 Practical realisation**.

Services and costs

Some of the work needs to be implemented by a professional. To build the solar thermal system you will need a plumber, an installer and – in case the device is installed on the roof - a crane. This will result in additional costs, which can be added here.

Tools

The building of a solar thermal plant requires some tools. You can find a list of all tools needed in the learning units **LU 3_2 Solar thermal system_planning installation** and **LU 5_1 Practical realisation**. Some of the tools are quite common, like a hammer, but some are more specific tools that you will probably have to buy.

Please note: If you are assisted in the work by an installer and /or plumber, he or she will provide the most of the required tools. The costs for Services will reduce the costs for tools!

Information

Even if you do not need permissions, it is still good to inform neighbours and stakeholders about the project.

For each cost category you can add:

- Description
- Amount (How many of it did you buy/need?)
- Costs (Prize of one item)
- Date finished
- Date created
- Upload (add a document, e.g., a bill)

Attention! To avoid losing your cost data at the **Preparing page** of the **Process Guide**, please select the place for your plant first (**LU 3_1 Site selection** and **Planning Tool** of Our Solartown) and add the costs afterwards.

Costs:

After selecting one of your solar thermal systems in the **Planning tool** and adding all the costs, you can see the following data in the menu point "costs":

- the name of the plant
- the useful space heated in kWh/a
- the saved greenhouse gases in kg
- the solar coverage
- the energy cost in €/kWh
- the cost of the solar thermal system

Now you can calculate the **estimated saved money per year** and the **return on investment** (number of years = cost for solar thermal plant / estimated saved money).





Possibilities of financing a solar thermal system

Once you know the costs of your solar thermal system you can start to think about the financing. There are various possibilities, some of them depending on the country.

In **Slovenia** there are the following possibilities:

1. The School Fund - there are funds raised by grants, parents and pupils themselves.
2. Municipality - as the owner of the school or through a local public call for dedicated funds.
3. Eco Fund - Environmental Public Fund for co-financing environmental projects where you can obtain 20% subvention or loan to buy and install the solar thermal system. This also applies to public institutions.
4. Organisation of performances and events - admissions to the school dance, theatre performances, singing performances, sporting events, markets with children's products, bingo ...).
5. The collection of waste paper jams, appliances ...
6. Sponsorships - Finding local businesses that work in a similar field.
7. Crowdfunding: Multiple investors simultaneously contribute funds and help entrepreneurs, groups or individuals to realise their planned project, or to find different crowdfunding plat-forms through donations (raising money for charity without donors receiving rewards).

It is important how you present the project in the selected web platform. You have to set a period for collecting sources and fundraising goal (how much of the founding you want to obtain). Since each online platform has its own way of crowdfunding, it is necessary to know the conditions of the campaign, how much financial contribution they require (how much percentage of the raised funds and the cost for each transfer). You also need to consider what happens if the campaign is successful or not (whether the money is paid anyway), and what your chosen platform provides (assistance with the campaign...)

Possible Crowdfunding platforms are:

- <https://wemakeit.com/>
- <https://www.qofundme.com/>
- <https://www.crowdfunder.co.uk/>
- <https://donatemyschool.com/>

In **Austria** there are various possibilities for financing a solar thermal system:

1. Funding from the municipality: The municipality supports or finances the project as a school maintainer, or the municipality applies for funding from Communal Credit Public Consulting
2. Submission as a climate-school project in the program "model regions for climate and en-ergy" of the "Klima- und Energiefonds". Joint project with a regional focus: Partners from business and research cooperate with educational institutions (from kindergarten to high school)

<https://www.klimaundenergiemodellregionen.at/>





LEARNING UNIT 3.2: LEARNING PLAN

3. Apply for funding at "Talents regional" - FFG. It is a joint project with a regional focus: partners from business and research cooperate with educational institutions.
<https://www.ffg.at/talente-regional>
4. Support from the parents' association of the school.
5. Organize fundraising and/or auctions
6. Performance of plays and musicals
7. Organizing flea markets, selling pastries and other home-made or hand-made items.
8. Sponsorship by regional companies or banks.

In **Greece**, there are all-saw various possibilities for financing a solar thermal system:

1. Public Investment Program
2. National Strategic Reference Framework (NSRF)
3. National programs e.g. ILEKTRA Program for Energy upgrade of public buildings
4. Consignment Deposits and Loans Fund
5. European funding sources
6. Own funding by the local municipality probably from special duties (e.g. Special RES Duty, Duty for the Development of Industrial Areas with Power Generation from Lignite plants. etc.)

Picture:

<https://www.freepik.com/photos/background>'>Background photo created by rawpixel.com - www.freepik.com





Learning Unit 3.3 - Teaching Plan

Solar thermal system costs

In this unit, pupils calculate the costs and explore the possibilities of financing the construction of a solar thermal system at the school.

TIME: 45 min

CLASS ORGANISATION: frontal, group work

METHODOLOGY: discussion, work online, group work

LESSON GOALS:

Pupils:

- learn how to use the *Process guide* of Our Solartown
- calculate all the costs for the construction of the solar thermal system in school
- explore financing possibilities for the construction of the solar thermal system

MATERIALS:

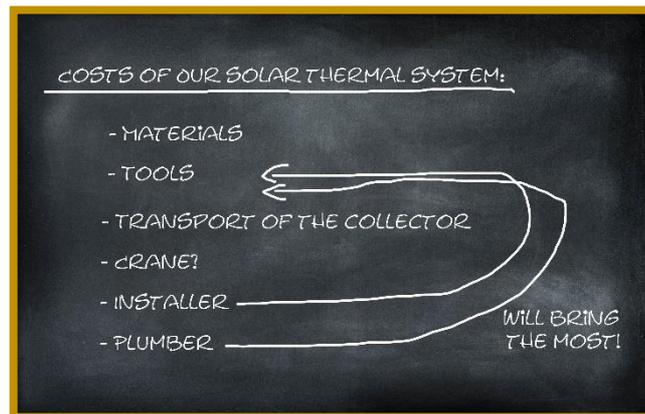
- computers
- worksheets
- posters, markers

INTRODUCTION/MOTIVATION (10 min):

The teacher starts a discussion about the costs of a solar thermal system. After working on **LU 3_1 Site selection** and **LU 3_2 Solar thermal plant_planning installation** the pupils should have some ideas:

- Materials
- Tools
- Transport (Crane?)
- Installation
- Installer
- Plumber

The ideas of the pupils are written on the blackboard.



MAIN PART (35min):

The teacher and the pupils discuss about the mind map on the blackboard. Afterwards the results of the **lesson LU 3_2 Solar thermal system_planning installation** are entered in the **Preparing page** of the **Process Guide**. If necessary the teacher helps the pupils to work with the Process Guide of Our Solartown. The necessary steps are:

- 1) Do the ranking of your planned solar thermal systems in the Planning Tool and select your favourite:

This is part of **LU 3_1 Site selection**. Make sure that you selected one of the planned solar thermal systems in the Planning Tool **first**, before you move on to step 2.





2) Enter the results and costs in the **Preparing** page of the **Process Guide**:

3) The costs will be shown in the **Costs** page of the **Process Guide**.

Now you can see the following data in the menu point "**Costs**":

- the name of the plant
- the useful space heated in kWh/a
- the saved greenhouse gases in kg
- the solar coverage
- the energy cost in kWh
- the cost of the solar thermal system

Now you can calculate the **estimated saved money per year** and the **return on investment** (number of years = cost for solar thermal plant / estimated saved money).

Possibilities of financing a solar thermal system:

As the costs are known now, the pupils can try to find a solution how to finance the solar thermal system and collect their ideas on the blackboard.

If the class really wants to build a solar thermal system, of course the help of the teacher, the school and the municipality will be needed.

More information about the actual building process of the solar thermal system you can find in our learning unit **LU 5_1_Practical realisation**.



ASSESSMENT (5min):

If you want the pupils to experience the different opinions on solar thermal energy try the role plays of Our Solartown next:

- **RP 3_1 Site selection:** Selecting the most suitable school to install a water heating system based on location criteria
- **RP 3_2 Installation pros and cons:** Installation of a solar thermal system in a public swimming pool
- **RP 3_3 Financing a solar plant:** Search for a sponsor to fund a school's solar thermal system





Contacts:



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Climate Alliance Austria

Website: <http://www.klimabuendnis.at/>



Solar Heat Europe/ESTIF

Website: <http://www.solarheateurope.eu/>



KPE Pertouliou Trikkeon, Greece

Website: <https://blogs.sch.gr/kpepertoul/>



VseUK Institute, Slovenia

Website: <http://www.vseuk.si>



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