



Heating-Matrices showing recommended RES Heating Technologies fitting to various Building Types & Qualities

Report D4.1

Project Coordinator: Austrian Energy Agency – AEA

Work Package 4 Leader Organization: WIP

October 2020



This project has received funding from the European Union's Horizon 2020 Research and innovation programme under grant agreement No 847087.

Authors

Franz Zach, Herbert Tretter, Austrian Energy Agency (AEA), Austria

Ingo Ball, Wirtschaft und Infrastruktur GmbH & Co Planungs KG (WIP), Germany

Andreas Scharli, Energiewende Oberland Bürgerstiftung für Erneuerbare Energien und Energieeinsparung (EWO), Germany

Rafael Ayuste Cupido, Ente Publico Regional De La Energia De Castilla Y Leon (EREN), Spain

Iva Tustanovski, Regionalna Energetska Agencija Sjeverozapadne Hrvatske (REGEA), Croatia

Emilija Mihajloska, Vladimir Gjorgievski, Natasha Markovska, Ljupcho Dimov, Dimitar Grombanovski, Sasha Maskimovski, Internacionalen centar za održiv razvoj na energetske, vodni i okolinski sistemi-SDEWES-Skopje (SDEWES Centre), Croatia

Dražen Balić, Energetski institut Hrvoje Požar (EIHP), Croatia

Samra Arnaut, ENOVA D.O.O. Sarajevo (ENOVA), Bosnia and Herzegovina

Angel Nikolaev, Black Sea Energy Research Centre (BSERC), Bulgaria

Slobodan Jerotic, Grad Sabac (GRAD SABAC), Serbia

Gašper Stegnar, Boris Susic, Marko Matkovic, Jozef Stefan Institut (JSI), Slovenia

With contributions by:

ENOVA (graphical editing for publishing in this report and editing for access to interactive single matrices on the project website replace-project.eu)

With thanks to:

The Austrian Federal Ministry of Climate Action, Environment, Energy, Mobility, Innovation and Technology (for making available the existing Austrian Heating-Matrices for “single- and two-family” and “large volume” residential buildings as blue-prints for developing further ones beyond Austria, adapted to the conditions existing at the project partners’ countries’ target regions of REPLACE).

Project coordination and editing provided by Austrian Energy Agency.

Manuscript completed in October 2020

This document and the interactive heating matrices are available on: www.replace-project.eu

Document title	Matrices leading to “right” RHC systems (according to Grant Agreement)
Work Package	WP4
Document Type	Deliverable
Date	30. October 2020
Document Status	Final version

Acknowledgments & Disclaimer

This project has received funding from the *European Union's Horizon 2020 research and innovation programme* under grant agreement No 847087.

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Background and purpose of this report

The heating matrix provides an initial overview of which heating system based on renewable (non-fossil) energy sources or district heat is most suitable for your building.

Space heating systems based on energy from renewable sources use solar energy both directly via solar collectors for domestic hot water preparation and possibly also for auxiliary space heating, and indirectly in its stored form as biomass for boilers or ambient heat (water, earth, air) for heat pumps.

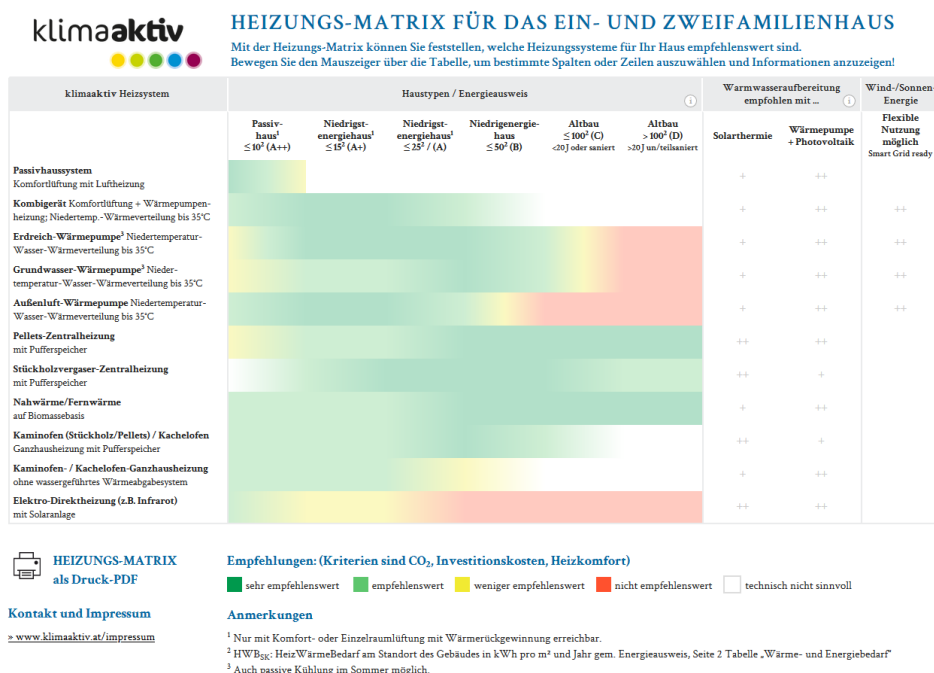
Introduction to Heating Matrices

The so-called heating matrix, developed within the Austrian climate protection initiative “klimaaktiv” of the Austrian Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology (BMK), is a tool that gives an overview of available alternative (non-fossil) energy sources for heating systems in different types of buildings and a broad range of thermal insulation qualities.

Heating matrix for “single and double family houses” and “large volume buildings”

There are two versions of the heating matrix: One is for single and double family houses and the other one is for larger houses as multi-family houses or hotels, etc.

The heating matrix for single and double family houses gives advice to homeowners or planners of single and double family houses which heating system(s) based on non-fossil fuels is/are the best choice for a certain building. The same applies to the heating matrix for large volume buildings. The existing German version of the heating matrix for single and double family houses is shown below.



Adaptation to conditions in target regions of REPLACE

The matrices presented in this report, starting from the Austrian blueprints, were adapted regionally with regard to structural and environmental conditions, building standards and the economic viability with regard to renewable (non-fossil) energy source (RES) based heating technologies recommended in the matrices. This means that different climatic conditions, shares of coal, oil and gas in the national electricity mix (emission factor) for the operation of heat pumps, modern RES based ovens not in use in Austria etc. were taken into account adequately on a regional level.

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1 | Legal Disclaimer

The beneficiaries of the European Horizon 2020 project REPLACE have prepared the present heating matrices for single and double family houses and larger volume buildings in accordance with the original heating matrices elaborated within the Austrian klimaaktiv programme¹ of the Austrian Federal Ministry for Climate Protection, Environment, Energy, Mobility, Innovation and Technology (BMK) to the best of their knowledge and belief.

The matrices published in this report have been prepared for the target country in question by the respective project partner in consultation with relevant regional actors with the greatest care, taking into account country- resp. region-specific conditions. However, the participating authors cannot assume any liability for the correctness, completeness and topicality of the content. Furthermore, all authors in charge are not liable for any damages, in particular direct or indirect as well as material or immaterial damages caused by the use of the information provided.

The same applies to the European Commission, which financed the production of this website, and the Austrian BMK, which provided the original versions.

¹ klimaaktiv is the Austrian climate protection initiative and integral part of the Austrian climate strategy. Its primary objective is to launch and promote climate-friendly technologies and services. In doing so, klimaaktiv focuses on high standards of quality, provides education and training of professionals, gives advice and cooperates with a large network of partners (see [klimaaktiv.at](https://www.klimaaktiv.at)).

Introduction to the REPLACE Project

REPLACE is a European project with the aim of informing and motivating people in nine different countries to replace old and inefficient heating systems in residential buildings with environmentally friendly alternatives. Funded under the EU Horizon 2020 programme for three years (2019 – 2022), REPLACE develops and implements boiler and oven replacement campaigns to support changes towards achieving the climate targets and making Europe independent of oil, coal and natural gas.

Half of Europe's energy consumption is used for heating or cooling. However, two thirds of the heating systems installed in Europe (80 million units) are inefficient. As a rule, these outdated heating systems are only replaced when they fail completely during use or are about to fail. This often leaves no time for informed decisions or a change of energy source. In addition, the amount of information required for a switch is high: many questions have to be clarified and different actors need to be consulted. Often people do not have enough money to be able to afford (currently still) more expensive low-CO₂ systems, even if the life cycle costs are already significantly lower and much less risky.

REPLACE wants to tackle those and other local challenges and barriers by developing and testing locally adapted, tailor-made replacement campaigns – for the first time, in parallel – across ten European pilot regions with a total population of 8 million. Those are the ten European pilot regions in the nine participating countries:

- Austria: Federal State of Salzburg
- Bosnia and Herzegovina: Canton of Sarajevo
- Bulgaria: Rhodope Mountain Region
- Croatia: Primorsko goranska County, City of Zagreb incl. three bordering counties
- Germany: Bavarian Oberland
- North Macedonia: KAGoP Region
- Republic of Serbia: City of Šabac
- Slovenia: Slovenia
- Spain: Castilla y León Region

Specifically, the project targets consumers, investors/owners as well as intermediaries, like installers, chimney sweeps, energy advisors and consultants, and helps them to make well-informed decisions. Simple renovation measures that pay-off quickly as they reduce overall space heating consumption for a low investment and which are implemented as coordinated community actions are also part of the programme.

In order to develop efficient and strongly service-oriented campaigns as well as user-friendly information tools, REPLACE identifies requirements for implementation actions concerning infrastructure, regulations and law, it investigates stakeholders' mind-sets and their needs, refers to lessons learnt from previous projects, and develops action plans tailor-made for each pilot region. The replacement campaigns are to be launched and supported by the project partners on-site by local working groups, bringing public authorities, end consumers, installers, chimney sweepers, energy consultants, equipment manufacturers, energy supply companies, policy makers and other key players

to one table. Together, they will design comprehensive, locally adapted effective action packages tackling the main barriers and challenges end consumers and installers face when boilers or ovens shall be replaced.

REPLACE's primary objectives are to

- understand the heat markets as well as the mind-sets and needs of end consumers, intermediaries (like installers, chimney sweepers, energy advisers) and investors,
- identify and reduce market barriers and to foster an enabling environment as well as better and trustworthy services,
- improve framework conditions, planning and investment security,
- better inform all stakeholders of the benefits of a heating or cooling system replacement, according to their information needs and preferred formats,
- enable consumers to take informed decisions, encouraging sustainable energy behaviour,
- strengthen the trust of end consumers in intermediaries and in the reliability of renewable HC systems and related (service) suppliers,
- transfer know-how from more advanced to less advanced countries in this field, e.g. by training of installers in South-Eastern European countries,
- create and implement locally adapted, tailor-made replacements campaigns addressing and overcoming replacement barriers in ten European pilot regions, while also testing, steering and improving them on-site, and
- to make the project's findings available for replication in other countries and regions.

REPLACE also addresses fuel poverty and gender issues and reduces the risk of a heating crisis by supporting the use of regional renewable energy sources (such as solar, ambient heat or biomass) and HC equipment produced within the EU (biomass boilers, heat pumps, solar collectors, etc.).

2 | Matrices of REPLACE Pilot Region “Federal State of Salzburg” in Austria

In the following chapters screenshots of the two matrices for each country resp. region are shown. The matrices will also be available on the project website.

2.1 Heating Matrix for single and double family houses

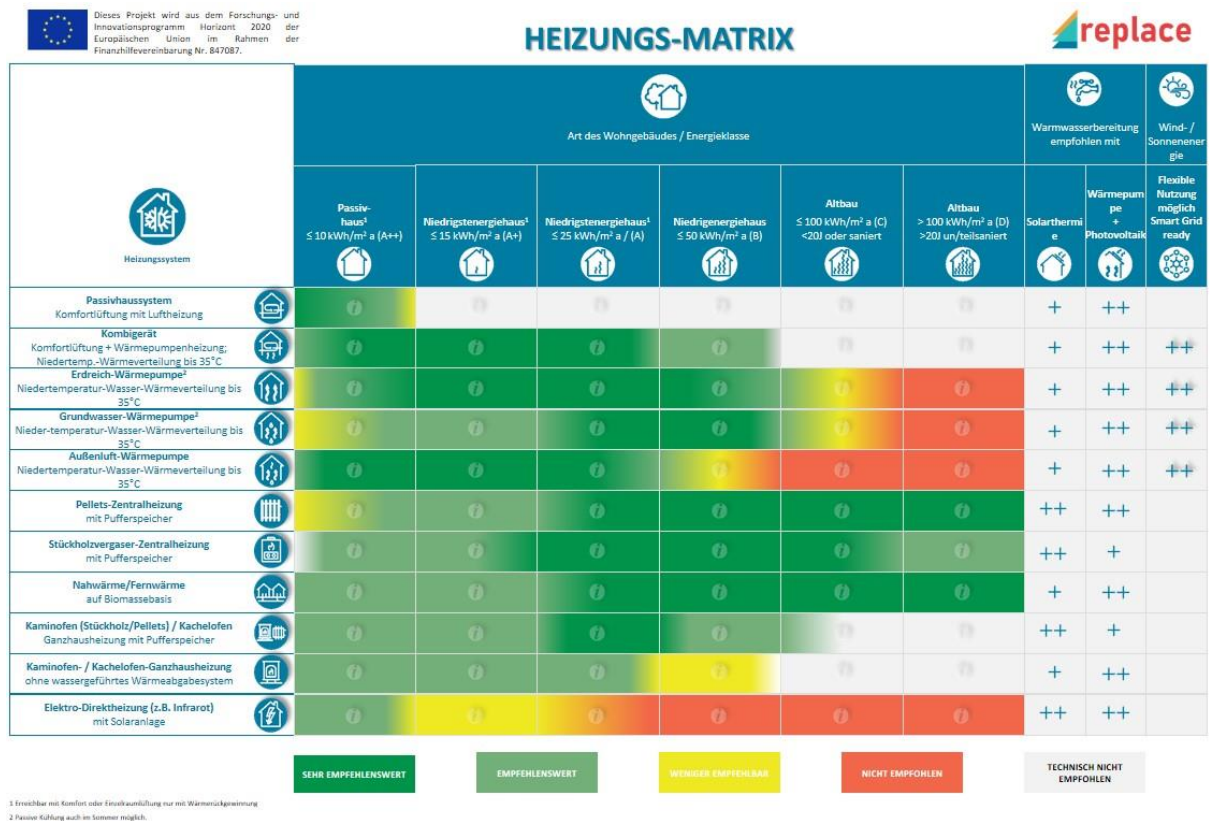


Figure 1: Heating Matrix for single and double family houses for Austria (is applicable on federal level, countrywide too), Source: Austrian climate protection initiative “klimaaktiv” of BMK, graphically adapted by ENOVA

2.2 Heating Matrix for larger volume buildings



Dieses Projekt wird aus dem Forschungs- und Innovationsprogramm Horizont 2020 der Europäischen Union im Rahmen der Finanzhilfevereinbarung Nr. 847087.

HEIZUNGS-MATRIX



Systemkombinationen	Niedertemperaturwärmeabgabesystem und Warmwasserbereitung Vorlauftemperatur <35 °C					Hochtemperaturwärmeabgabesystem und Warmwasserbereitung Vorlauftemperatur >55 °C				
	Gebäudeklassen					Gebäudeklassen				
	A++	A	B	C	D-G	A++	A	B	C	D-G
Pelletzentralheizung + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT
Hackgutheizung + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT
Biomasse Nahwärmeheizung + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT
Erdreich-Wärmepumpe mit Erdkollektor + Solaranlage	SEHR GUT	SEHR GUT	GUT	WENIGER GUT	WENIGER GUT	SEHR GUT	SEHR GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET
Erdreich-Wärmepumpe mit Erdsonde + Solaranlage	SEHR GUT	SEHR GUT	GUT	WENIGER GUT	WENIGER GUT	SEHR GUT	SEHR GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET
Grundwasser-Wärmepumpe + Solaranlage	SEHR GUT	SEHR GUT	GUT	WENIGER GUT	WENIGER GUT	SEHR GUT	SEHR GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET
Luft-Wärmepumpe + Solaranlage	WENIGER GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET	NICHT GEEIGNET	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET

Eignung:

Gut/weniger gut: Luft-Wärmepumpen mit zusätzlicher Wärmequelle, Abluft aus Hallenbad oder Wellnessbereich sind bei Gebäuden der Klassen A+ und A++ ebenfalls sehr gut geeignet

SEHR GUT GUT WENIGER GUT NICHT GEEIGNET

Haftungsausschluss:
Weder die Europäische Kommission noch eine im Namen der Kommission handelnde Person ist für die Verwendung der folgenden Informationen verantwortlich. Die in dieser Veröffentlichung geäußerten Ansichten liegen in der alleinigen Verantwortung der Autoren und spiegeln nicht unbedingt die Ansichten der Europäischen Kommission wider. Vervielfältigung und Übersetzung für nichtkommerzielle Zwecke sind gestattet, sofern die Quelle angegeben ist.

Figure 2: Heating Matrix for larger volume buildings for Austria (is applicable on federal level, countrywide too), Source: Austrian climate protection initiative "klimaaktiv" of BMK, graphically adapted by ENOVA

3 | Matrices of REPLACE Pilot Region “Canton of Sarajevo” in Bosnia and Herzegovina

3.1 Heating Matrix for single and double family houses

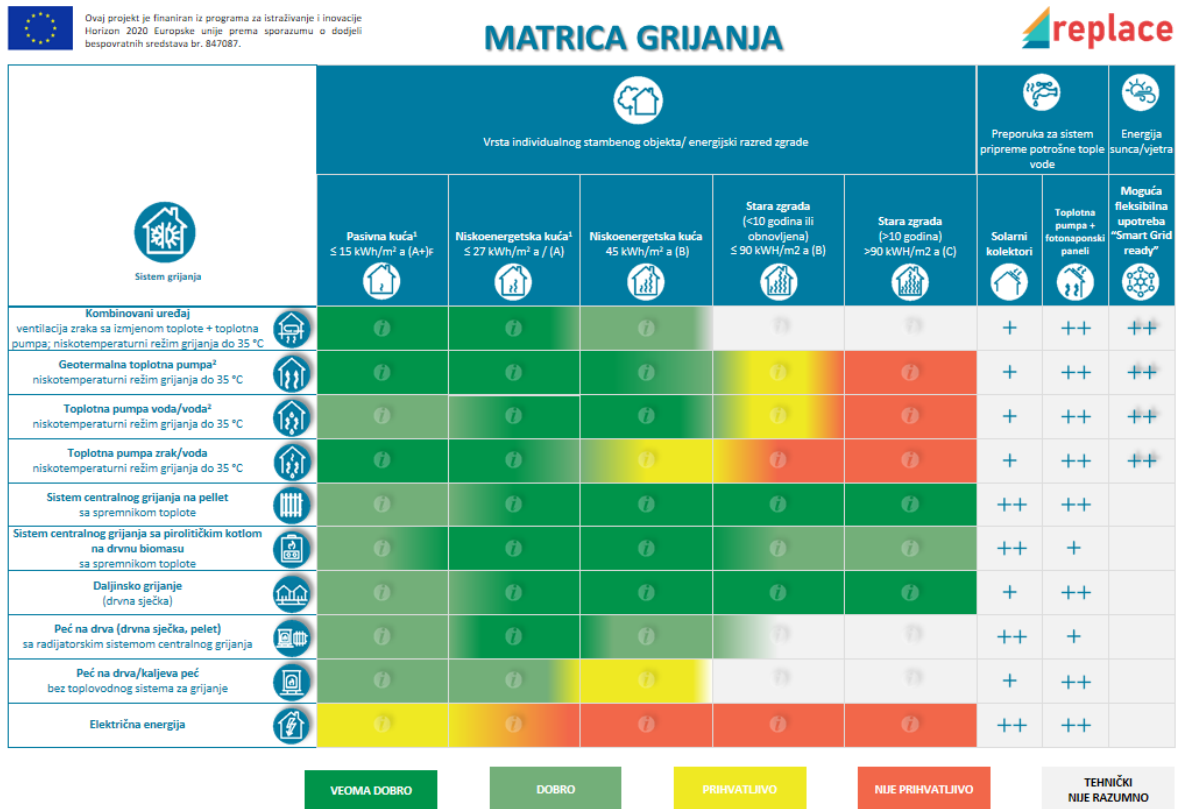


Figure 3: Heating Matrix for single and double family houses (is applicable in whole Bosnia and Herzegovina),
Source: ENOVA, graphically edited by ENOVA

3.2 Heating Matrix for larger volume buildings



Ovaj projekt je financiran iz programa za istraživanje i inovacije Horizon 2020 Europske unije prema sporazumu o dodjeli bespovratnih sredstava br. 847087.

MATRICA GRIJANJA

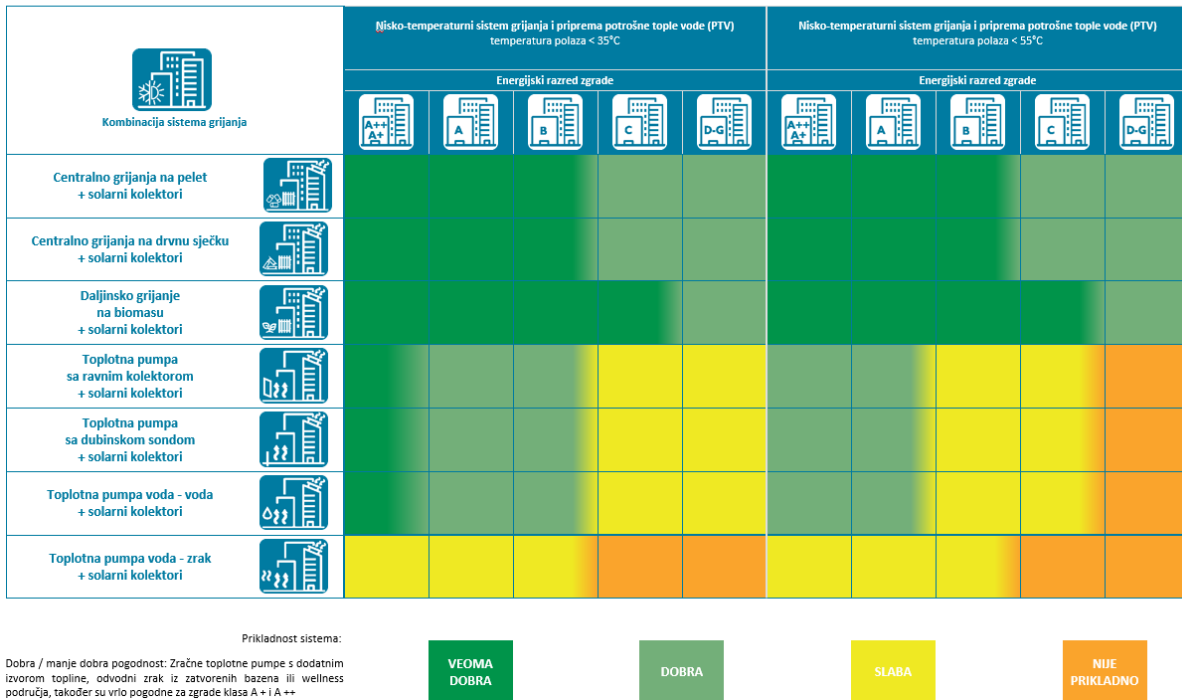


Figure 4: Heating Matrix for larger volume buildings (is applicable in whole Bosnia and Herzegovina), Source: ENOVA, graphically edited by ENOVA

4 | Bulgaria: Rhodope Mountain Region

4.1 Heating Matrix for single and double family houses



Figure 5: Heating Matrix for single and double family houses for Rhodope Mountain Region, Bulgaria, Source: BSERC, graphically edited by ENOVA

4.2 Heating Matrix for larger volume buildings



Този проект се финансира от изследователската и иновационна програма на Европейския съюз „Хоризонт 2020“ съгласно споразумение за безвъзмездна помощ № 847087

ОТОПЛИТЕЛНА МАТРИЦА



 Комбинации от отоплителни системи	Нискотемпературна отоплителна система и битова гореща вода (БГВ) температура на входа <35 °С					Нискотемпературна отоплителна система и битова гореща вода (БГВ) температура на входа <55 °С				
	Клас на енергийна ефективност					Клас на енергийна ефективност				
	A++	A	B	C	D-G	A++	A	B	C	D-G
Локално* отопление на пелети	Green	Green	Yellow	Red	Red	Green	Green	Yellow	Red	Red
Локално отопление на пелети + слънчеви колектори	Green	Green	Yellow	Red	Red	Green	Green	Yellow	Red	Red
Локално отопление на дървесни трески	Red	Yellow	Green	Green	Green	Red	Yellow	Green	Green	Green
Централно отопление на биомаса	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Геотермална термопомпа (енергия от почвата или подпочвени води)	Red	Red	Yellow	Green	Green	Red	Red	Yellow	Green	Green
Термопомпена система въздух - вода	Red	Yellow	Green	Green	Green	Red	Yellow	Green	Green	Green

* под локално се има предвид общ котел за цялата сграда.

Оценката на отоплителните решения се основава на финансово оценка за целия жизнен цикъл на технологията.

МНОГО ДОБРО

сравнително добро

сравнително лошо

МНОГО ЛОШО

Отговорности:

Нито Европейската комисия, нито каквото и да е лице, действащо от името на Комисията, не носи отговорност за каквото и да е използване на следната информация. Мненията, изразени в тази публикация, са единствената отговорност на авторите и не отразяват непременно вярванията на Европейската комисия. Възпроизвеждането и преводът с нетърговска цел са разрешени при посочване на източника.

Figure 6: Heating Matrix for larger volume buildings for Rhodope Mountain Region, Bulgaria, Source: BSERC, graphically adapted by ENOVA

5 | Croatia: Primorsko goranska County, City of Zagreb incl. three bordering counties

5.1 Heating Matrix for single and double family houses

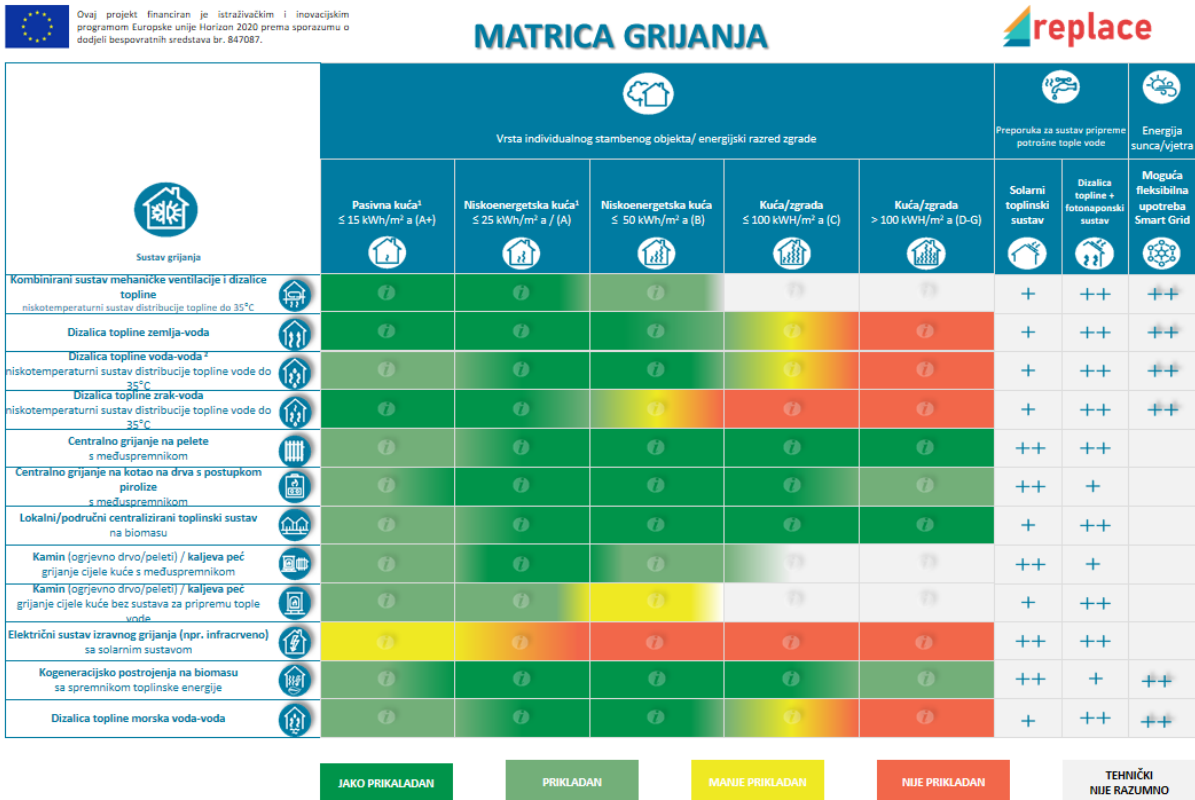


Figure 7: Heating Matrix for single and double family houses for Primorsko goranska County, City of Zagreb incl. three bordering counties, Source: REGEA, graphically edited by ENOVA

5.2 Heating Matrix for larger volume buildings



Ovaj projekt financiran je istraživačkim i inovacijskim programom Europske unije Horizon 2020 prema sporazumu o dodjeli bespovratnih sredstava br. 847087.

MATRICA GRIJANJA



 Kombinacije sustava grijanja	Nisko-temperaturni sustav grijanja i pripreme tople vode temperatura polaza < 35°C					Nisko-temperaturni sustav grijanja i pripreme tople vode temperatura polaza > 55°C				
	Energetski razred zgrade					Energetski razred zgrade				
	A++	A	B	C	D-G	A++	A	B	C	D-G
Centralno grijanje na pelete + solarni sustav	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Grijanje na drvenu sječku + solarni sustav	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Grijanje na biomasu + solarni sustav	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Dizalica topline zemlja - voda s kolektorom + solarni sustav	Green	Green	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
Dizalica topline zemlja - voda sa sondom + solarni sustav	Green	Green	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
Dizalica topline voda - voda + solarni sustav	Green	Green	Yellow	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
Dizalica topline zrak - voda + solarni sustav	Yellow	Yellow	Orange	Orange	Orange	Yellow	Yellow	Orange	Orange	Orange

Pogodnost sustava:

Dobra / manje dobra pogodnost: Zračne dizalice topline s dodatnim izvorom topline, odvodni zrak iz zatvorenih bazena ili wellness područja, također su vrlo pogodne za zgrade klase A+ i A++

JAKO PRIKLADAN	PRIKLADAN	MANJE PRIKLADAN	NIJE PRIKLADAN
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Figure 8: Heating Matrix for larger volume buildings for Primorsko goranska County, City of Zagreb incl. three bordering counties, Source: REGEA, graphically adapted by ENOVA

6 | Germany: Bavarian Oberland

6.1 Heating Matrix for single and double family houses

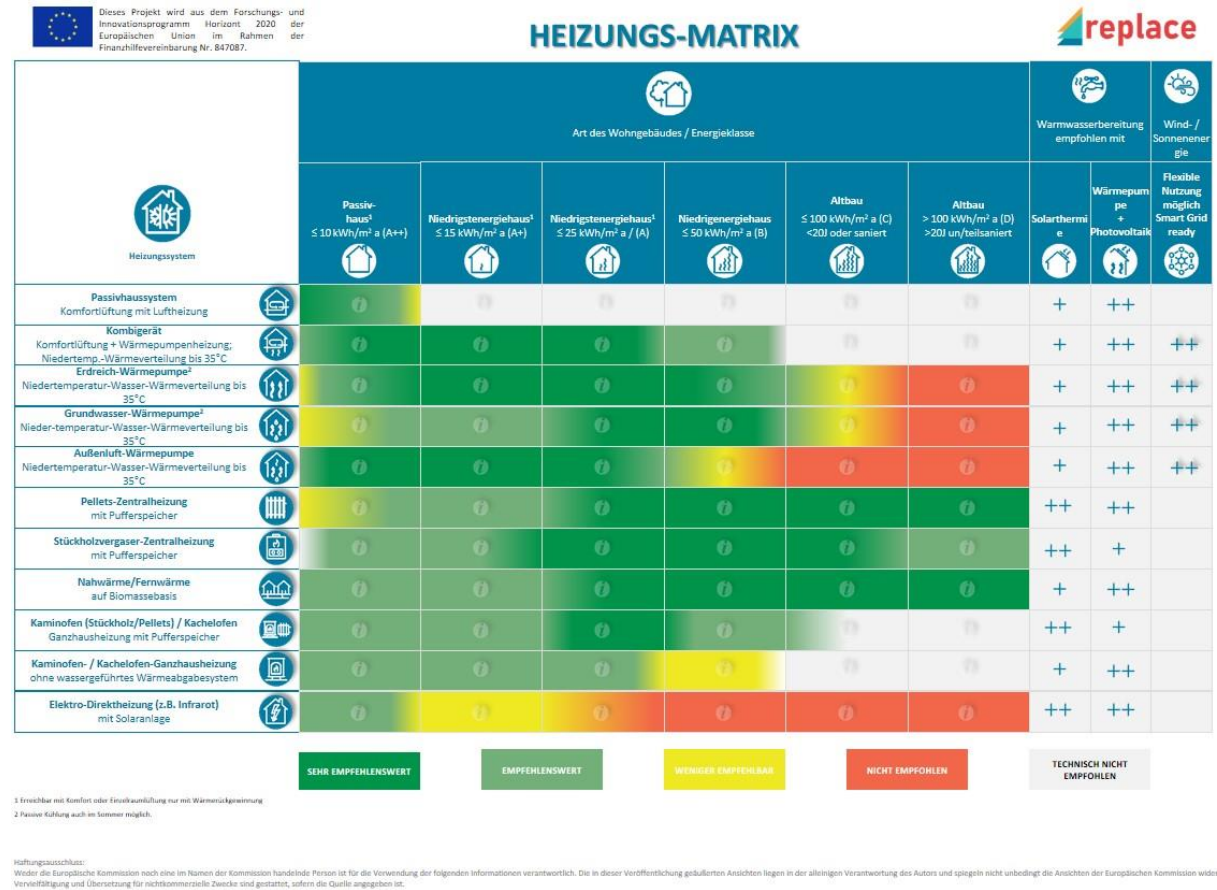


Figure 9: Heating Matrix for single and double family houses for Bavarian Oberland, Germany, Source: WIP, EWO, graphically edited by ENOVA

6.2 Heating Matrix for larger volume buildings



Dieses Projekt wird aus dem Forschungs- und Innovationsprogramm Horizont 2020 der Europäischen Union im Rahmen der Finanzhilfevereinbarung Nr. 847087.

HEIZUNGS-MATRIX



Systemkombinationen	Niedertemperaturwärmeabgabesystem und Warmwasserbereitung Vorlauftemperatur <35 °C					Hochtemperaturwärmeabgabesystem und Warmwasserbereitung Vorlauftemperatur >55 °C					
	Gebäudeklassen					Gebäudeklassen					
	A++	A+	A	B	C	A++	A+	A	B	C	D-G
Pelletzentralheizung + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT
Hackgutheizung + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT
Biomasse Nahwärmeheizung + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT	SEHR GUT
Erdreich-Wärmepumpe mit Erdkollektor + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET
Erdreich-Wärmepumpe mit Erdsonde + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET
Grundwasser-Wärmepumpe + Solaranlage	SEHR GUT	SEHR GUT	SEHR GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET
Luft-Wärmepumpe + Solaranlage	WENIGER GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET	NICHT GEEIGNET	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	WENIGER GUT	NICHT GEEIGNET

Eignung:

Gut/weniger gut: Luft-Wärmepumpen mit zusätzlicher Wärmequelle, Abluft aus Hallenbad oder Wellnessbereich sind bei Gebäuden der Klassen A+ und A++ ebenfalls sehr gut geeignet

SEHR GUT GUT WENIGER GUT NICHT GEEIGNET

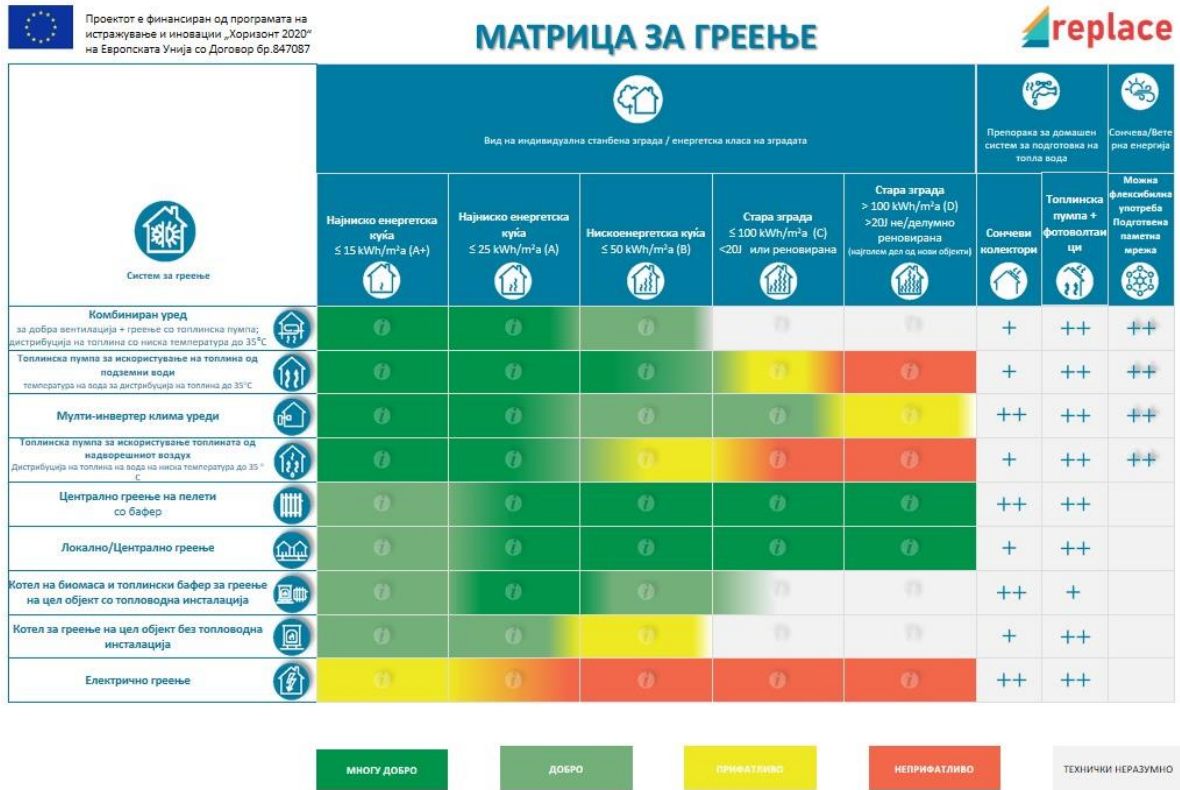
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Figure 10: Heating Matrix for larger volume buildings for Bavarian Oberland, Germany, Source: WIP, EWO, graphically adapted by ENOVA

7 | North Macedonia: KAGoP Region

7.1 Heating Matrix for single and double family houses



Одредувањето: Ниту Европската комисија, ниту кое било лице што дејствува во име на Комисијата не е одговорно за употребата што може да се направи од сподени информации. Својите изјави во оваа публикација се единствено одговорност на авторите и не мора да ги одразуваат ставовите на Европската комисија. Репродуција и пренос за некомерцијални цели се одобрени под услов да се признае изворот.

Figure 11: Heating Matrix for single and double family houses for KAGoP Region, North Macedonia, Source: SDEWES-Skopje, graphically edited by ENOVA

7.2 Heating Matrix for larger volume buildings

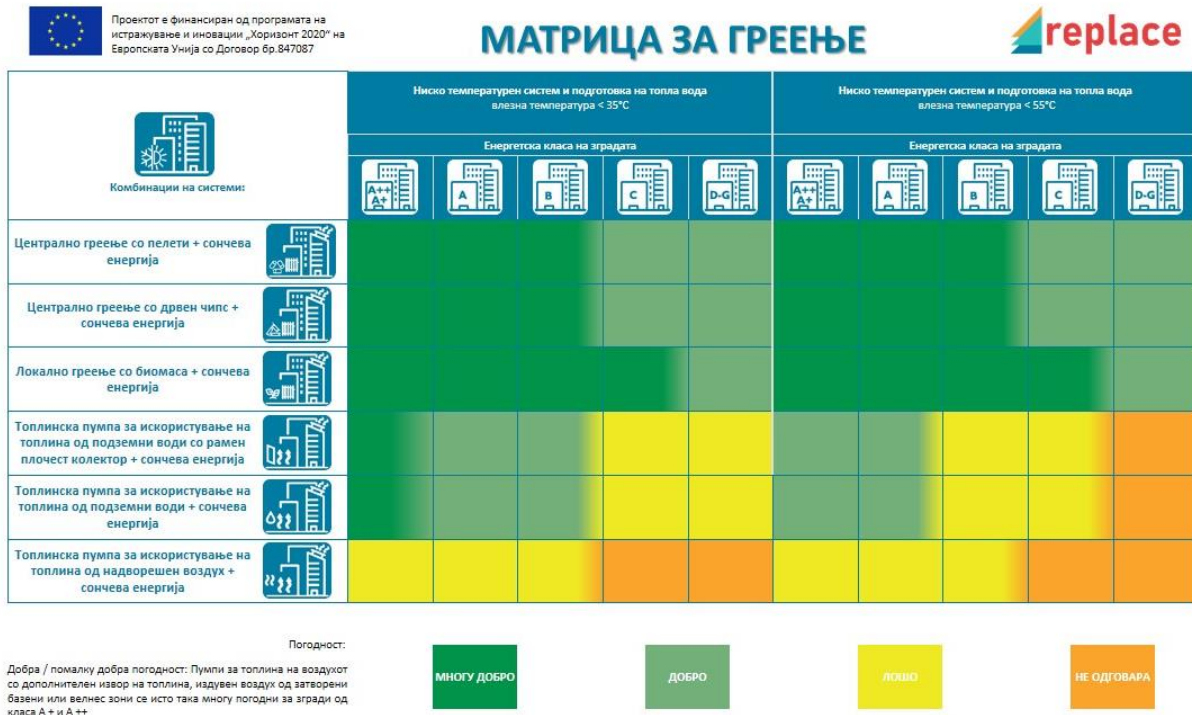
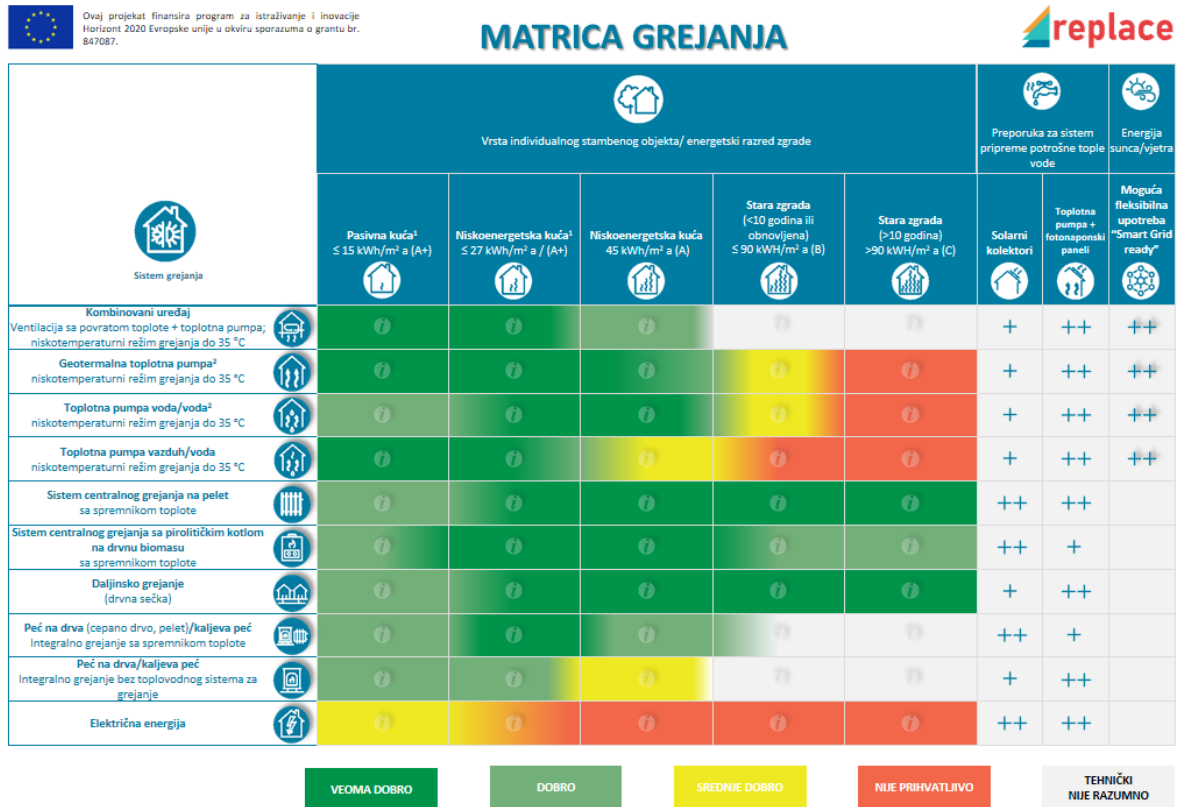


Figure 12: Heating Matrix for larger volume buildings for KAGoP Region, North Macedonia, Source: SDEWES-Skopje, graphically adapted by ENOVA

8 | Republic of Serbia: City of Šabac

8.1 Heating Matrix for single and double family houses



¹ Moguće postići uz sistem mehaničke ventilacije s rekuperacijom toplote.
² Moguće je i pasivno hlađenje ljeti.

Izjava o odricanju odgovornosti:
 Niti Evropska komisija niti bilo koja osoba koja deluje u ime Komisije nije odgovorna za upotrebu sledećih informacija. Stavovi izraženi u ovoj publikaciji isključivo su odgovornost autora i ne odražavaju nužno stavove Evropske komisije. Reprodukција i prevod u nekomercijalne svrhe su odobreni pod uslovom da je naveden izvor.

Figure 13: Heating Matrix for single and double family houses for City of Sabac, Serbia, Source: GRAD SABAC, graphically edited by ENOVA

8.2 Heating Matrix for larger volume buildings



Ovaj projekt finansira program za istraživanje i inovacije
Horizont 2020 Evropske unije u okviru sporazuma o grantu br.
847087.

MATRICA GREJANJA



 Kombinacije sistema grejanja	Nisko-temperaturni sistem grejanja i priprema tople potrošne vode (PTV) temperatura na ulazu < 35°C					Nisko-temperaturni sistem grejanja i priprema tople potrošne vode (PTV) temperatura na ulazu < 55°C				
	Energetski razred zgrade									
	A++	A	B	C	D-G	A++	A	B	C	D-G
Centralno grejanje na pelet + solarno	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Centralno grejanje na drvenu sečku + solarno	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Lokalno (daljinsko) grejanje na biomasu + solarno	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
Geotermalna toplotna pumpa sa ravanskim kolektorima + solarni	Green	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
Geotermalna toplotna pumpa sa dubinskom sondom + solarna	Green	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
Toplotna pumpa za podzemnu vodu + solarna	Green	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
Toplotna pumpa koja koristi spoljni vazduh kao izvor toplote + solarna	Yellow	Yellow	Yellow	Orange	Orange	Yellow	Yellow	Yellow	Orange	Orange

Prikladnost sistema:

Dobra / manje dobra pogodnost: Vazdušne toplotne pumpe sa dodatnim izvorom toplote, izdovni vazduh iz zatvorenih bazena ili velnes zona takođe su vrlo pogodne za zgrade klase A+ i A++

VRLO DOBRO

DOBRO

LOŠE

NIJE PRIKLADNO

Figure 14: Heating Matrix for larger volume buildings for City of Sabac, Serbia, Source: GRAD SABAC, graphically adapted by ENOVA

9 | Slovenia: Slovenia

9.1 Heating Matrix for single and double family houses

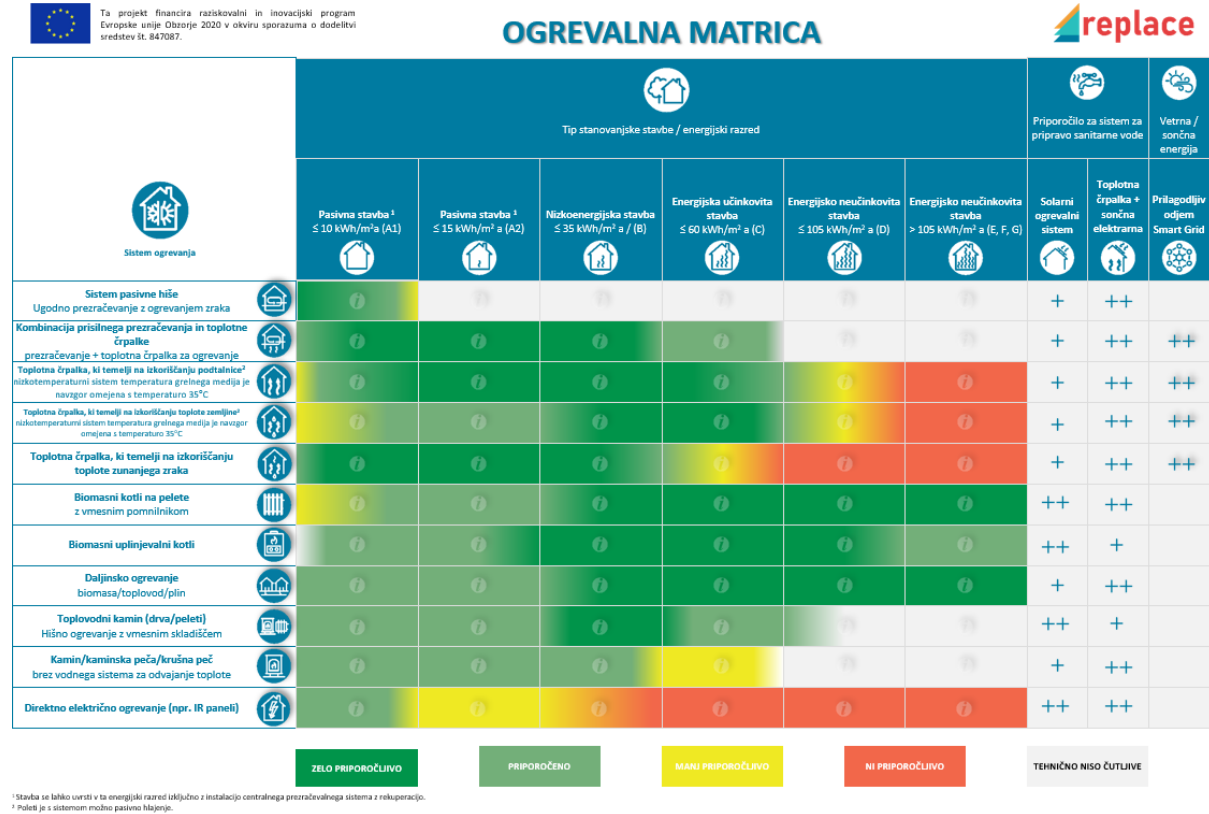


Figure 15: Heating Matrix for single and double family houses for Slovenia, Source: JSI, graphically edited by ENOVA

9.2 Heating Matrix for larger volume buildings



Ta projekt financira raziskovalni in inovacijski program Evropske unije Obzorje 2020 v okviru sporazuma o dodelitvi sredstev št. 847087.

OGREVALNA MATRIKA

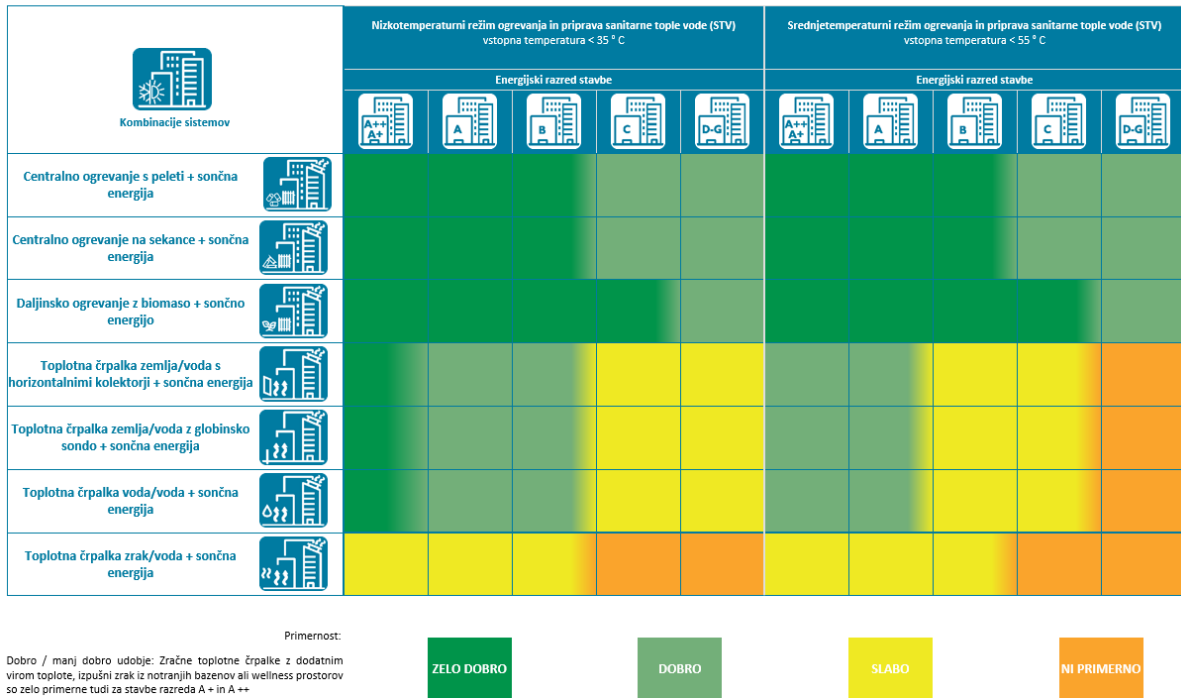


Figure 16: Heating Matrix for larger volume buildings for Slovenia, Source: JSI, graphically adapted by ENOVA

10 | Spain: Castilla y León Region

10.1 Heating Matrix for single and double family houses

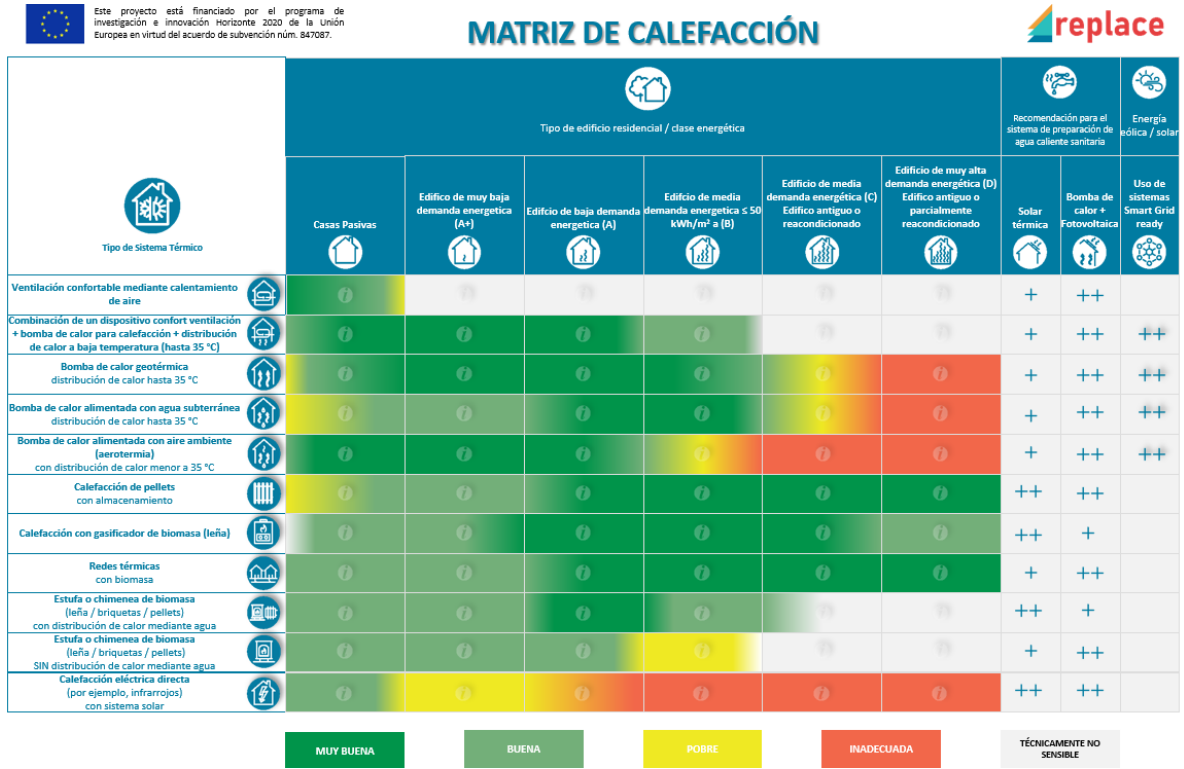


Figure 17: Heating Matrix for single and double family houses for Castilla y León Region, Spain, Source: EREN, graphically edited by ENOVA








10.2 Heating Matrix for larger volume buildings



Este proyecto está financiado por el programa de investigación e innovación Horizonte 2020 de la Unión Europea en virtud del acuerdo de subvención núm. 847087.

MATRIZ DE CALEFACCIÓN



 Combinación de sistemas	Sistema de distribución a baja temperatura y preparación de agua caliente sanitaria (ACS) temperatura de entrada < 35°C					Sistema de distribución a baja temperatura y ACS temperatura de entrada < 55°C				
	Clase del edificio					Clase del edificio				
	A++	A	B	C	D-G	A++	A	B	C	D-G
 Calefacción con pellets + solar	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
 Calefacción con astillas + solar	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
 Red térmica con biomasa + solar	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green
 Bomba de calor geotérmica horizontal enterrada + solar	Green	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
 Bomba de calor geotérmica con pozos + solar	Green	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
 Bomba de calor alimentada con agua subterránea + solar	Green	Green	Green	Yellow	Yellow	Green	Green	Yellow	Yellow	Orange
 Bomba de calor alimentada con aire ambiente (aeroterminia)+ solar	Yellow	Yellow	Orange	Orange	Orange	Yellow	Yellow	Orange	Orange	Orange

Idoneidad:
Buena / menos buena comodidad: las bombas de calor de aire con fuente de calor adicional, aire de escape de piscinas cubiertas o áreas de bienestar, también son muy adecuadas para edificios de clase A+ y A++



Figure 18: Heating Matrix for larger volume buildings for Castilla y León Region, Spain, Source: EREN, graphically adapted by ENOVA

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