

Date - duben 2022

Project name

Strategic outputs of the ClimArchi.Net project

The project is co-financed by the EUKI programme. EUKI is an initiative of the Federal Ministry of Economic Affairs and Climate Protection (BMWK), the mission of which is to encourage cooperation within the EU in terms of further development and implementation of ambitious climate-related policy. Through the EUKI, the stakeholders in the field of climate can learn from each other; the initiative promotes intra-European dialogue, exchange of best practices, awareness raising and knowledge transfer.



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2. INTRODUCTION

The ClimArchi.Net project is [funded by the EUKI programme](#), supported by the Ministry of the Environment and Nuclear Safety.

The project implementation is ensured through the cooperation between

- Centrum pasivního domu, z.s (CZE)
- Inštitút pre pasívne domy (SK)

The aim of the project is to identify the current situation and support development of innovative processes, materials and technologies for the preparation and implementation of buildings with very low energy needs throughout their life cycle. Support transformation of the building sector towards carbon neutrality, building adaptation to climate change and social and energy security. More information about the project and its activities in the Czech Republic can be found on the CPD website and on the climarchi.net information platform.

In 2020-2022, the project focused on discussions with experts and on sharing of examples of good practices in sustainable architecture:

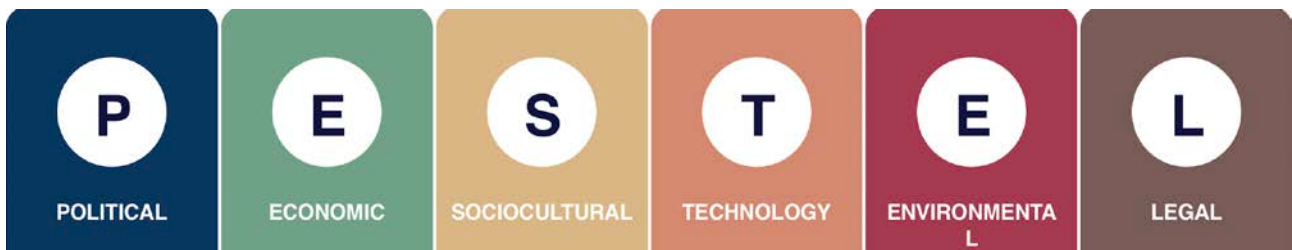
- **2 expert round-tables** with experts and invited guests
- **3 discussion workshops** with experts and invited guests
- **1-day international conference** on [Connection of Buildings & Sustainability](#)
- **3-day excursion to see examples of good practices** in sustainable architecture in Berlin
- **development of the information platform on sustainable architecture** climarchi.net



2.1. Objective of the document

- Summary of findings, available documents and expert opinions from individual fields who have participated in the implementation of the project as part of discussions, workshops and international conferences
- Summary of recommendations resulting in faster transformation of the designers (in the role of architects) and contracting authorities (public administration) in public contracts with the aim of designing and constructing buildings with very low energy demands, adapted to climate change, political situation and social and energy security.
- Taking into account PESTEL multi-criteria requirements

Picture1 - Taking into account multi-criteria requirements



2.2. Target groups:

The document is intended for the following target groups:

- Architect (Czech Chamber of Architects)
- Public administration (level of regions, cities & municipalities)
- Ministry of Environment
- Ministry for Regional Development
- Ministry of Industry and Trade
- Ministry of Education, Youth and Sports
- State Environmental Fund
- State Investment Support Fund
- Cities and municipalities



2.3. ClimArchiNet project expert team



- **Ing. Tomáš Vanický** = expert sponsor of the ClimArchiNet project / CPD director

He has been the director of [Centrum pasivního domu v ČR](#) since 2018. In 2019, together with leading Czech architects, he issued the [Declaration of Sustainability](#), which supports a change in the attitude of all stakeholders in the construction sector towards sustainable architecture. Tomáš graduated from the Faculty of Civil Engineering of the Czech Technical University, majoring in civil engineering physics. He started his career at Enviros. Since 2011, he has been engaged in the renovation of buildings in conservation areas in order to improve their energy standards. His aim is to inspire the market with a higher standard of buildings, and direct the market environment towards quality, comfortable, healthy, accessible and energy-efficient buildings.

- **Ing. arch. Josef Tlustý** = Architect/ČKA, member of the CPD Board

He graduated from ČVUT Praha, Faculty of Architecture He completed his studies with a diploma project entitled: Revitalization of ice houses in Prague Braník - Gallery of Fine Arts in the studio run by architect Jan Sedlák.

He has been dealing with sustainability in cooperation with AB Ateliér and participating in educational events organized by CPD since 2009. As part of his own work, he deals with projects and construction management of energy-passive houses.

Member of the CPD since 2019. Member of the CPD Council since 2020, where he intensively cooperates on the ClimArchiNet project. It aims to open up a broader discussion with architects, municipalities and institutions in the field of sustainability. The objective is to raise awareness of the professional public and state administration in this field and thus help this country move towards carbon neutrality.



■ **Ing. arch. Jan Soukup** = Architect / ISU ČKA

Since his architectural studies he has been involved in constructing buildings made of natural materials and in participatory design. He is currently developing this knowledge together with Marek Dohelský in the Second Nature studio, which focuses on shared living/cohousing projects and introduction of the principles of circular architecture in the project design phases. He has co-initiated the Czech Declaration of Architects for Sustainability, Architects for the future, and focuses on the current challenges of achieving carbon-neutral architecture in operational land material terms.

■ **doc. Ing. Tomáš Matuška, Ph.D.** = Specialist on building energy management, associate professor at the Faculty of Mechanical Engineering at the Czech Technical University in Prague

He gives lectures at the Faculty of Mechanical Engineering at the Czech Technical University in Prague on renewable energies and heat supply and leads the research department of Building Energy Systems at the Czech Technical University UCEEB research centre in Buštěhrad. His research work focuses on solar heating systems, advanced heat pumps and energy storage systems. He works as a researcher in a number of national and international research projects. The core of his work related to practice consists in contract research in the field of designing energy concepts of buildings, systems for energy plus neighbourhoods, including their heating systems.

■ **Ing. Radim Kohoutek** = Energy Specialist / APES, DS Energy Consulting

Since 2003, he has been involved in savings projects, in particular Energy Performance Contracting (EPC) type of projects, of which he spent 12 years at SIEMENS, where he worked for 4 years as project manager and then for 8 years as the director of the energy services business unit. In 2010, he was involved in the establishment of the Association of Energy Service Providers, where he worked for a number of years, and since 2019 he has represented APES as its executive director. He also acts as executive in the consulting company DS Energy Consulting, which focuses on consulting in the field of sustainable energy and preparation of projects based on the EPC and Performance Design & Build methods.

■ **Mgr. Ing. Anna Francová** = Lawyer / Frank Bold Advokáti

Is a partner at the law firm Frank Bold Advokáti. Her specializations include energy law, which, among other things, protects clients against incorrect or unlawful actions taken by control bodies. In recent years, he has dealt with the transposition of European regulations into national law. From the practical point of view, within the team she addresses matters related to the use of energy in communities and set-up of such communities so that they can make the best use of the benefits. She is the author or co-author of over a dozen legal breakdowns in the field of energy. She is also deals with the preparation of tender dossiers, public contract administration and preparation of dialogues between contracting authorities and contractors, promoters and participants.



■ **Ing. Stanislav Kutáček** = Ekonomist / Frank Bold Advokáti

Is a senior business consultant at Frank Bold Advokáti. He mainly advises his clients on projects related to community energy, he deals with relations between municipalities and investors, sustainable construction and matters related to the new EU legislation concerning ESG and Green Deal. He has also participated in the preparation of a series of Bold Future educational conferences and [publication](#) with the same name, which provides a catalogue of practical measures for sustainable construction. In the past he worked as Chief Financial Officer at Frank Bold. He is also the founder and chairman of the first Czech carsharing association, Autonapůl.

■ **Ing. Vladimír Kubeček** = Ekonomist / University of Economics, Prague

Works at the University of Economics in Prague at the Center for Economy in Regulated Sectors and at Charles University at the Environment Centre, where he focuses on energy strategies, energy system transformation tools and energy regulation, and he also works in the ČEPS strategy and business development department. Before returning to the Czech Republic, he worked as the director of the coal, electricity and renewable energy statistics section in the Energy Data Center at the International Energy Agency (IEA) in Paris.

3. INITIAL ANALYSIS

The initial analysis is based on expert discussions (architects, energy specialists, lawyers, economists, and public administration representatives) who are actively involved in the preparation of projects that receive public funds.

The public funds need to be spent in a manner that establishes sustainable conditions for contractors, operators and serves as an example for private investors.

Based on the expertise and practical experience of the individual experts, the perception of needs is highly diversified. Even in the group of experts who are "convinced" of the need to implement sustainable measures, there is no consensus reached on a common approach to de-carbonizing the building sector.

The aim of the ClimArchi.Net project is to present available innovations (in terms of approach, available materials and technologies for construction of buildings aimed at low environmental pollution and achieving carbon neutrality of this sector in the long run.

Centrum pasivního domu has long been developing passive standards and buildings with very low energy demands to ensure a healthy and comfortable indoor environment. These demands are currently reflected in the implementing regulations of the individual Member States based on the Energy Performance Building Directive (EPBD).

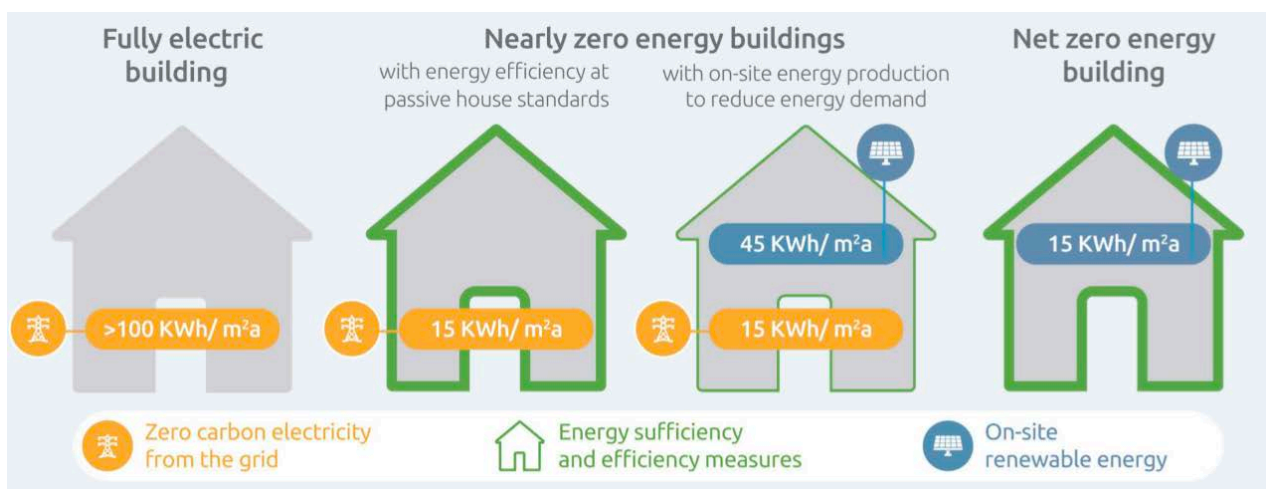


Requirements for heating technical parameters are increasingly extended by this Directive and its implementing regulations in order to include the need to install renewable and alternative sources of energy. The objective is to achieve energy self-sufficient buildings or territorial units.

Although we are aware of the fact at the time when this document was prepared (April 2022) a general regulation to achieve energy-efficient buildings is not possible with regard to the technical and economic possibilities of the Czech environment, we consider it important to develop this area further and to monitor and highlight outcomes of the individual projects which take the path of applying available innovations and energy independence.

In the process of transforming towards a low-carbon economy it is important to ensure that an acceptable consensus is reached.

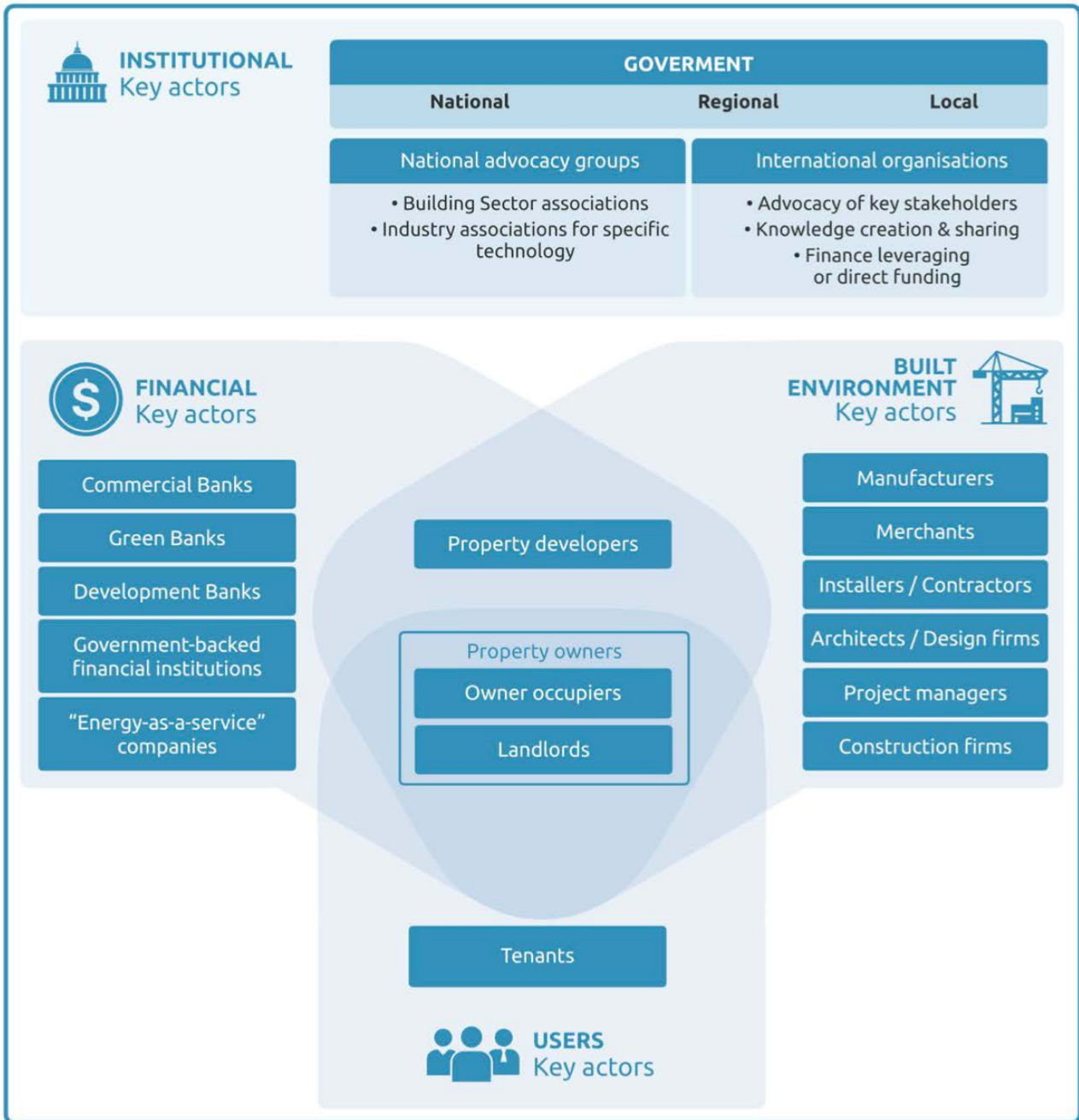
Picture2 - Different ways to reaching an energy self-sufficient buildings



Source: Climate Action Tracker, Decarbonising buildings, Achieving zero carbon heating and cooling, March 2022



Picture3 - Key players in the construction sector who need to work together to decarbonize the construction sector



Source: Climate Action Tracker, Decarbonising buildings, Achieving zero carbon heating and cooling, March 2022



3.1. Knowledge & Experience & Priorities

In the Czech Republic, a number of organizations have developed methodologies and design and evaluation tools (PHPP, SBTool, BREAM, LEED, WELL, etc.).

3.1.1. Architect

Current situation, presentation by the ČKA representative in the Board of Directors of the ACE European Council of Architects - (Ing. arch. Pavel Martinek)

There is a lively debate ongoing in all sectors about the environmental impact of human activities and the construction sector is one of the most important stakeholders in this respect

In 2020, the EPBD (Energy Performance of Buildings) Directive was amended, which did not bring about any fundamental changes but it provided the missing tools and knowledge on how to design and assess environmental friendliness in general. The promotion of "smart" building solutions introduces only partial measures that will not result in any fundamental changes. Despite negative experience with the methodology of Energy Performance Certificates (in the Czech Republic, Decree no. 264/2020 Sb.), the assessment of buildings is again made only at the level of primary energy consumption. The reason is simple, there has been no agreement on any other method yet. The Level (s) methodology, which is still too complex for normal use and not required by law, is being tested and still stays out of interest of both the investors and designers.

Given the lack of a common European policy, the individual countries come with their own initiatives and besides a number of declarations, the first legislative measures are being developed, such as in Finland, where the use of wooden civil structures in public procurement is given priority to.

The obligation to introduce the so-called "renovation passports" and questions related to the use of BIM are generally discussed. Some measures thus make sense on a regional level only while others tend to have no effect without the necessary methodology in place. Therefore, the general principles of circular economy are being discussed at the EU level, and it would be desirable for the ČKA representatives to take part in this discussion. Its principles ultimately support the position of architects and the need of holistic designs.

EU-driven initiative

The Responsible Architecture working group at the ACE (European Council of Architects) currently comments on the European Commission's material concerning circular economy. Building design is not a simple process and a number of conflicting requirements come into play here such as robustness/demountability, durability/flexibility, renovation/demand for new buildings, etc.

Under the Construction 2020 initiative, there is a thematic group called "Sustainable Use of Natural Resources", which brings together representatives of the European Commission, member states and other stakeholders with the aim of agreeing on essential steps towards a circular economy in the construction industry.



Since 2017, a number of discussions have been under way to obtain a balanced approach, which has resulted in the working document which is currently being consulted. Its purpose is to disseminate information to all stakeholders on the principles and steps that should be followed. This document also reflects the currently developed and tested Level(s) methodology

In 2016, the Building and Demolition Protocol was published by this group. The group is presently focusing on extending this protocol to recoverability and recycling. Newly designed buildings should produce less waste, use more durable materials, reduce environmental impacts and emphasize a holistic life-cycle cost approach.

Basic idea

- The involvement of all stakeholders is needed to start up the circular economy. This document distinguishes between users, designers, construction companies, material manufacturers, demolition companies, developers and national or regional institutions.
- To improve the public awareness of already existing possibilities, it is necessary to point out positive examples of implementation benefiting from the advantages of holistic design.
- To promote and develop reusable materials market- focus on adjusting the legislative environment in terms of guarantees, initiatives of contracting authorities and develop supply models such as take-back or product as a service.
- Adequacy of measures is needed so that benefits outweigh costs. This should be based on three basic aspects depending on the extent of their application:
- Durability - the construction materials should have the same durability as the expected service life of the building. Wherever this is not possible due to anticipated changes in use, it is necessary to ensure their recyclability, easy disassembly, etc. This is related to the overall easy serviceability of the civil structures. To ensure collection and keeping of information about the building the materials used, construction and design characteristics of the building equipment.
- Adaptability - to develop a design culture, a quality paradigm that anticipates demands for changes and enables adaptability instead of premature demolition.
- Waste reduction and its advanced management - focus on easy repairability, improvements, preferences given to reusable and recyclable materials.
- As regards the conceptual design of the building - the ability to assess the building in terms of its life-cycle, potential for transformation and recycling



- The building design itself- consider the building as a multi-layer/modular structure, the individual layers of which are more independent and easier to adapt.
- Use of material with regard to the elimination of its environmental footprint in the relevant region.

ČKA involvement

In the autumn of 2019, the ČKA working group was established by the Board of Directors. Its goal is to monitor in detail and comment on the newly drafted legislation in the field of sustainable construction. The ČKA also has its representative in the relevant ACE working group. In the past, the SRI (smart readiness indicator) methodology was successfully commented on. Similar attention must be paid to the circular economy.

One of the other tasks should be to assess and present the Renovation Passport. It is a document, a methodology that standardizes the provision of information about characteristics of a building, its use and schedule of servicing and inspections. This has been used in Germany for several years. Besides, the group should introduce and promote the Level(s) methodology.

If properly simplified and tested, this methodology could replace the existing Energy Performance Certificates in the next amendment to the EPBD Directive. This is a real step from thermal insulation of buildings towards their urban context, method of use, etc. However, it will hardly be possible without the engagement of general professional public.

Sustainability Working Group - ČKA

This group works on 7 pillars of sustainability, which were developed and presented by Ing. arch. Petr Lešek, head of the working group.

These pillars are defined as long-term meaningfulness, profitability and return on investment which also minimizes negative impacts on the surroundings.

- Complexity of the solution - the topic cannot be narrowed down to a single issue and a single expertise, there is a need for team interdisciplinary cooperation, including consideration given to the life cycle cost. The terms and conditions of grant schemes must also correspond to this.
- Urbanism and landscape - it is not just about the buildings The overall situation - the arrangement of municipalities and landscape - is crucial. The most energy-efficient building without quality urban planning will not make the necessary impact. In the long run, it is more advantageous not to build up other areas but to take care of already built-up zones including brown-fields.



- Quality architecture - a sustainable building or environment must also be of high quality in all respects, pleasant, durable, adjustable and nice; otherwise it will not be used for a long time. Technologies must not save the design solution - the design must be developed as comprehensive and interconnected work including its connection to the environment
- Adequacy - the solution must be adequate to the task, it is not possible to deal with reconstruction and new construction, football locker rooms in a village or a ministry building in the same manner. Even the best project, which is well executed, has little impact if the user cannot use it.
- Legislation and standards - they must react to new innovative solutions without hindering them. Give preference to simple solutions (low tech) - why makes things complicated when it can be done easily
- Active role of the public sector - the public investor must lead by example. Strategic documents on the topic should be prepared to be used by the city (regional) architect. Data collection and experience sharing.
- Public involvement - sustainability must not only be about experts but it must become part of the public debate. In cities, this is the role of the city architect.

3.1.2. ClimArchi.Net project working groups

As regards awareness raising in cities and municipalities, there has been an increase in educational activities over recent years; yet, according to experts, there is a **very low awareness of the proper approach to public procurement**.

- The information and experience of most architects in the Czech Republic is insufficient in terms of building sustainability.
 - Due to the demands for energy intensity and due to insufficient communication in some cases, there are increasing barriers between architects and energy specialists (who supplement insufficient architectural designs with technological solutions in order to meet legislative or grant scheme requirements)
- The buildings must be considered within the context of cities and municipalities and the life in them



- General statements often prevent from distinguishing between the suitability/meaningfulness of a project (a passive standard required for village club football locker rooms).
- The transfer depends on the specific people. A large number of methodologies results in information overload for all experts/contracting authorities. Without PERSONAL TRANSFER, even high quality methodologies and information materials are not used in an adequate manner.
- In the field of sustainable architecture and available innovations, the bearers of know-how are should be architects and designers, followed by cities and municipalities. However, the public administration does not have enough information needed to commission quality urban planning and surrounding landscape.
 - The architects follow the contracting authority's demands, their role is not about education. They must receive well-prepared assignments which they are able to fulfil based on their knowledge.
 - It is necessary to set up a simple form of information transfer (examples of good practice - for example, there is an effort to post these examples on the websites of the "national network of healthy cities"; however, the information posted here becomes invisible and untraceable similarly to other similar portals)
 - The ČKA has made an exhibition of award-winning buildings since 1992
 - It is necessary to publish UNSUCCESSFUL projects, which will complement examples of good practice.
 - According to the results of the ClimArchi.Net project workshop survey, over 70% of architects and designers do not use the LCA assessment tools
 - There is a lack of motivation, investor input and circumventing in the form of a "grey" economy
 - The contracting authority accepts the energy standard based on the architect's recommendation
 - The architects miss a LIBRARY OF GOOD PRACTICE EXAMPLES. The buildings must be carefully selected with regard to several years of operation, a minimum of 3 years



(this is linked to the award-winning buildings in architectural competitions, which, however, are unsustainable after their commissioning).

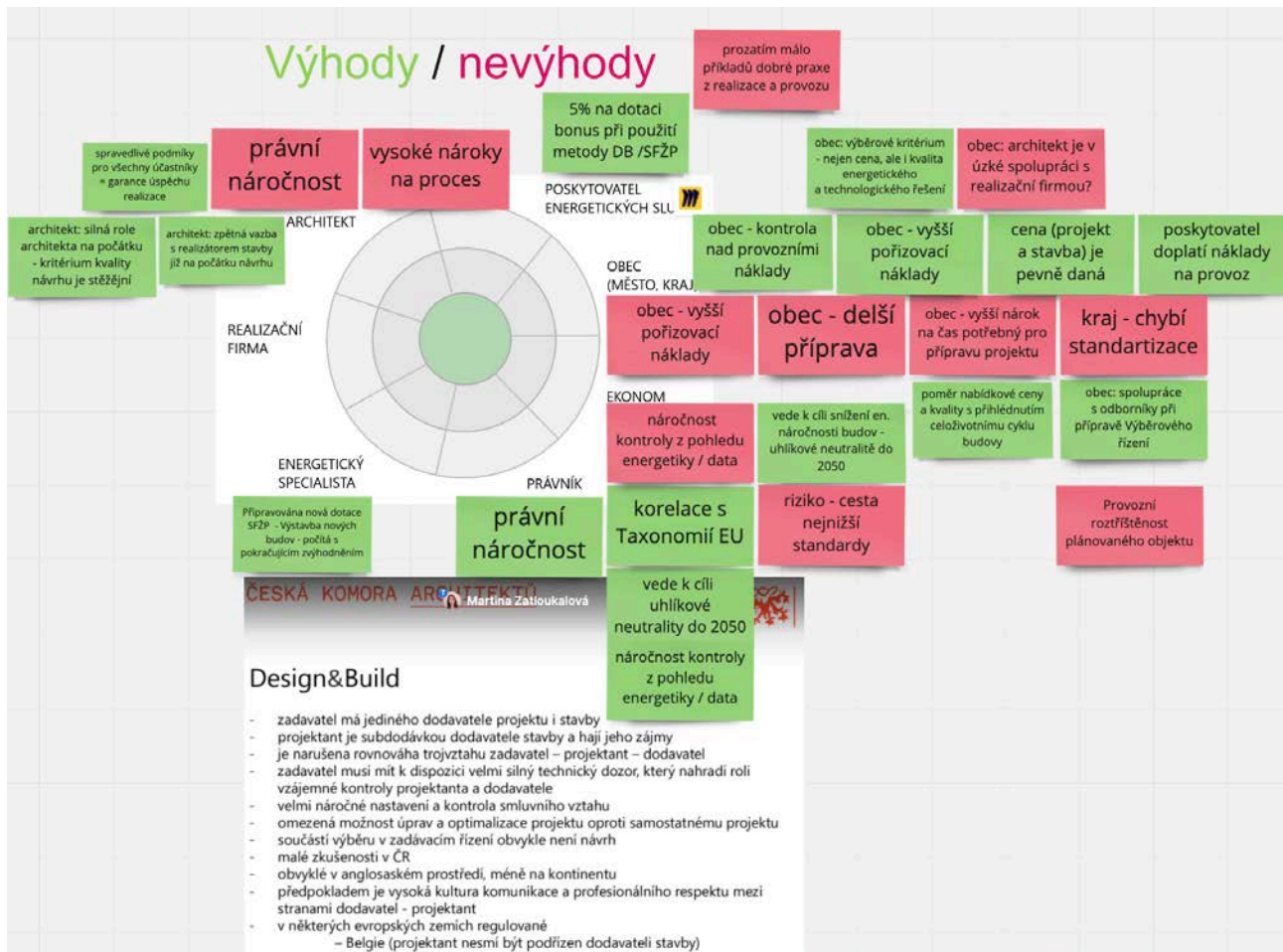
- In many cases, public procurement is still carried out in order to evaluate the capital expenditure of implementation. Other paths are often abandoned due to disagreements with the political opposition, common legislative practice and public procurement.
 - The price must be considered with regard to the costs and other selected parameters (CO2 emissions) throughout the building life cycle (Life Cycle Assessment -LCA)- this requirement should be taken into account when awarding the contracts. Public support is needed to enforce this requirement.
 - The state must ENCOURAGE public procurement with a view to constructing carbon-neutral buildings with regard to the LCA. Ensure this requirement so as make negotiations in specific municipalities easier.
 - The state must lead by example in its investment policy and make these examples sufficiently visible.
 - The public administration should be the body defining points that need to be met (a provision in a decree, or to allow the cities and municipalities to define parameters at their local level). The preparation of long-term methodological guidelines for experts can be based on such specifications.
 - As regards publicly funded projects, energy management of buildings should be included.
- The procurement terms and conditions should be in line with EU taxonomy, i.e. in line with the ESG sustainability criteria (Environmental, Social Governance). This will further expand the funding opportunities.
 - Preparation of specific requirements of the ČKA for architectural designs resulting in carbon neutrality of buildings must be made AS SOON AS POSSIBLE in connection with the architectural policy and construction culture in the Czech Republic.
- Terms and conditions leading to low energy demand and compliance with sanitary requirements inside the buildings should become a mandatory requirement in architectural competitions/tendering terms and conditions.



- There is a large number of methodologies on the market and neither the experts nor the contracting authorities (investors) can find their way through them. What is missing is a uniform, stable and sufficiently well-known and respected methodology
- Compared to the outputs of the 2020 workshops, the energy standard and the achievement of very low energy demands is a mist at the time of energy crisis caused by the conflict in Ukraine and the need to increase the share of renewable energies and reduce energy dependence on fossil fuel imports from third countries.
- Reconstruction of listed and devastated buildings should result in efficient operation of such a protected building for future generations, the national heritage personnel must be open to reasonable compromises and take into account the complexity of reconstruction in their requirements along with the costs in terms of life cycle costs and technical aspects (e.g. as regards casement windows, a single glazing in the outer frame is often required with a double glazing in the inner frame- from the point of view of energy specialist, there is a risk of moisture condensation and the opposite design is more advantageous)
 - Change the decision-making practice of public servants/national heritage institutes when assessing several criteria (cultural, heritage, technical and economic). Ensure that buildings are reconstructed with a view to its future use. In particular, it is necessary to open a discussion with the national heritage institutes on PV plants and green roofs for mitigating heat islands in city centres.
 - Discussions, mediation and examples of good practice contribute to changing the approach of national heritage institutes to reconstruction projects.
- Current methodologies such as DESIGN & BUILD, PERFORMANCE DESIGN & BUILD are suitable for a specific range of buildings, for which they offer undeniable advantages.



Picture4 - Output of Workshop 3 focused on the specific Performance Design&Build method



Other sources: About the Performance design&build method - <https://www.p-db.eu>

Due to the high requirements for experts, administration and overall project preparation, the above method is demanding in terms of pre-project and project preparation. During 3 workshops, the representative of the South Moravian Region stated, see <https://www.youtube.com/watch?v=0drN69onCzQ>, that in the case of lower investments (which corresponded to CZK 150,000,000 without VAT for the presented project), the region would probably drop using the Performance Design & Build method. This information was supplemented by the statement that repeating a similar process would probably reduce the capex of the pre-project and project work.



3.2. Evaluation of the current situation in the Czech Republic

We are all aware of the need to find a unified approach, a clear and up-to-date guide that will be well-known amongst the general and professional public and will be used by experts and for quality procurement, not only for public procurement. One such possible unifying portal can be, for example, the portal administered by the Ministry of Industry and Trade - <https://chytravolba.cz>

During the implementation and workshops within the ClimArchi.Net project and discussions, several important points emerged:

- A number of quality outputs and information from completed projects, which are not presented and updated within a context, result in information overload, e.g.
 - UCEEB - <https://www.uceeb.cz/cz/dokoncili-jsme-nastroj-pro-zkvalitnovani-verejne-vystavby>
 - UCEEB - <https://kvest.cz/>
 - BOLD FUTURE: <https://www.fbadvokati.cz/cs/sluzby/7306-bold-future-e-book-o-udrzitelnem-stavitelstvim-s-praktickym-katalogem-opatreni>
 - Manual for the evaluation of office buildings in the design phase http://www.sbtool.cz/img/metodiky/SBtoolCZ_ADM_2011.PDF
 - Application for social benefit calculation http://www.fce.vutbr.cz/ekr_model/default.asp?b=autori
 - Chances for buildings & UCEEB - <http://sanceprobudovy.cz/wp-content/uploads/2018/04/strategie-renovace-budov.pdf>
 - Agency KONIKLEC & PORSENNA, o.p.s. - <http://www.adaptacesidel.cz/data/upload/2016/09/budovy.pdf>
 - Agency KONIKLEC - <http://adaptacesidel.cz/default/kategorie?prispevek=138>
 - And many other materials which were prepared with the support of European and national programmes in the Czech Republic.
 - Furthermore, tools and methodologies used abroad are available, such as
 - Passive house institute in Darmstad - PHPP 9– EnerPHit Retrofit Plan
 - Climate consultant (University of California, Los Angeles - a universally applicable programme that processes local climate data into graphically understandable graphs and reports. Based on all such data, recommendations



are generated for the most effective environmental measures that should be incorporated into the design of buildings with regard to local climatic conditions. <https://www.sbse.org/resources/climate-consultant>

- SGS EDGE Green Building Certification
 - A global certification tool developed with a focus on reducing energy consumption, use of clean water and energy built into building materials, which has a free web application that can be used to verify projects (designs) even without a subsequent certification process. <https://edgebuildings.com/>
 - etc.
- The EPC method is based on the provision of energy services in the form of preparation, implementation and usually also energy savings measure funding. This method is suitable for a certain segment of already constructed buildings.
- MPO (https://www.mpo.cz/assets/cz/energetika/energeticka-ucinnost/energeticke-sluzby/2017/8/EPC-brochure_FINAL.pdf)
 - History described in the article by Mr. Sochor (<https://vytapeni.tzb-info.cz/uspory-vytapeni/6250-metoda-epc-a-jeji-uplatneni-i>)
 - comprehensive information with videos (<https://www.tzb-info.cz/epc-energy-performance-contracting>)
 - a methodology was developed specifically for street lighting <https://www.svn.cz/cs/aktualita/metodika-epc-projektu-pro-verejne-osvetleni>
- Performance Design & Build Method

Efficient construction with total minimum costs

Guidelines for possible steps for the contracting authorities in the implementation of construction projects using the Performance Design & Build (& Operate) method - focus on minimizing total life cycle costs (prepared by APES with a support from the EFEKT program, 2020), downloadable here: <https://www.p-db.eu/prilohy/35-ke-stazen>

- Guidelines for possible steps for the contracting authorities in the implementation of construction projects using the Design & Build (& Operate) method with a focus on minimizing total life cycle costs (prepared by **APES** with a support from the EFEKT



program, 2017)". Idea of how to interpret "principles of economic efficiency and **"acting with due care"**

1. Nevertheless, projects focusing on sustainability and reflecting life-cycle, impacts of implementation in terms of reducing emissions **are not** a common practice and examples of good practice need to be sought.
2. cooperation with energy managers is deepening
3. cities are more focused on the preparation of tendering terms and conditions and evaluate what they can achieve through the tendering - active in the implementation of community energy, Modernization Fund,...

Examples: <https://www.opzp.cz/zverejnujeme-metodiku-pro-projekty-pouzivajici-metodu-design-build-operate/> more about the method at <https://www.p-db.eu>

And related methodologies for developing a sustainable construction/renovation project by the contracting authorities:

The manual for comprehensive preparation of public building projects (<https://www.czgbc.org/files/2019/09/715db36dca69d0bd47d2968408678ad6.pdf>)

Public procurement brochure: How to develop a quality design of a sustainable green building?

(<https://www.czgbc.org/files/2020/01/9ed0346cd08aa687a89ad74148da0ef9.pdf>)

BOLD FUTURE: e-book on sustainable construction (<https://www.fbadvokati.cz/cs/sluzby/7306-bold-future-e-book-o-udrzitelnem-stavitelstvim-s-praktickym-katalogem-opatreni>) and related series of on-line trainings (<https://www.fbadvokati.cz/cs/specializace/7276-udrzitelne-stavitelstvi-pro-kvalitnejsi-zivot>)

- Projects supported by the EU or Czech programs that have been completed cannot be used without regular updates. Projects newly submitted to programs supported from public funds should, as one of the requirements, create NEW outputs (websites), with missing continuity and development of already closed projects
- There is a lack of a uniform DEFINITION acceptable for experts and the general public regarding the approach to achieving carbon neutrality in the building sector. CLEAR STATEMENTS AND SETTING OF OBJECTIVES IN THE BUILDING SECTOR. There is a lack of adequate analyzes or their publication to the professional and general public indicating the



objectives. It is necessary to communicate the expected new volume of construction work by 2030, 2050 and its energy and emission implications.

- Lack of sufficiently visible long-term communication of carbon neutrality recommendations (in uniform terminology) towards the target groups
- Missing statistics, % representation of the total number of accredited experts in the ČKA / ČKAIT professional chambers who deal with sustainable building development
- There is a lack of experts (energy specialists, tradespeople) on the market who have experience using innovations to achieve carbon-neutral buildings
- Correct public contract awards from the investors to architects is not sufficient and is often adjusted (e.g., financially undervalued)
- Contracting authorities do not have sufficient administrative capacity and funds to award contracts in the form of architectural competitions/design competitions, which could contribute to a higher quality of designs
- Buildings need to be taken into account in the global energy system (state, cities and municipalities)
- The funding institutions usually lack the knowledge of sustainability and its impact on risk reduction

3.2.1. Capacities - Architect

Architects involved in the project have a close relationship to sustainability.

The group of architects focused on sustainability is growing. The need to construct aesthetically pleasing buildings while taking into account the currently very specific requirement for a very low energy demand ensuring adequate internal thermal comfort throughout the year, is also perceived very differently in this group.

The topic is the Low-Tech approach and maximum use of available technologies that enable achieving very low energy demand while ensuring a healthy indoor environment with minimum use of technologies and at the same time supporting the development of local renewables.

As regards the approaches to building equipment with the highest possible share of modern technology and low-tech, these approaches differ significantly amongst the professional public.

According to estimates made by experts who participated in the ClimArchi.Net project, the group of practising architects accredited by the ČKA Chamber, who have sufficient experience in designing energy-efficient buildings while complying with the other sustainability requirements, is at approximately 15-20%.



Since 2018, as in other areas, the time capacities of architects have been "sold out". Therefore, the investor has very limited possibilities when looking for an expert in the field of architecture.

3.2.2. Capacities - Public administration (cities & municipalities)

According to estimates made by experts who participated in the ClimArchi.Net project, the group of cities & municipalities that are interested in and tender parameters of energy-efficient buildings in a sufficiently qualified manner, with compliance with other sustainability requirements, is at approximately 3-5%.

3.2.3. Capacities - Contractors and contracting companies

In an effort to maintain a high quality of implementation with limited manpower capacity, there is an increased need for prefabrication and construction automation.

These requirements need to be set with regard to the uniform strategy applied by the construction sector and the orientation towards a low-emission economy and carbon neutrality, including consideration of the requirements for health safety of the materials and structures used (so-called "Do Not Significant Harm").

Within the EU, the view of achieving carbon neutrality varies considerably, even within a single Member State.

While in the south of Germany, the requirement for the passive energy standard is not an exception for commencing design work, the permits necessary for implementation, for example in Berlin, encourage the low-tech applications.

The aim of both these approaches is to ensure an adequate indoor climate and to place a very high emphasis on natural and renewable materials, which help to meet the requirements for thermal comfort and a healthy indoor environment and very low energy requirements to ensure the operation of buildings and energy built into the building materials.

The suppliers and contracting companies are thus often in disagreement as to which approach to achieving carbon neutrality is suitable. They deal with current market requirements and are often not ready for a rapid change in the market environment requirements.



Picture 5 - Prefabricated cladding of the Berlin Zoo office building, reconstruction of a panel building from the 1960s



Note: The heating system technology did not change during the reconstruction. The prefabricated wall cladding and glazing achieve thermal technical properties required for the passive standard. The eLCA methodology was used, which assesses the building in terms of its built-in emissions. A comparison was made with the building before the reconstruction and the building in case of demolition and with the construction of a new building with the same energy intensity as the existing building after the reconstruction.

Source: ClimArchiTrip excursion - during the ClimArchi.Net project

The document drawn up as part of the Passive House III Platform project, deals with materials and technological development in the construction industry

- Road map - <https://www.pasivnidomy.cz/220126-cestovni-mapa-fin/f9197>
- Strategic research agenda - <https://www.pasivnidomy.cz/220125-sva-aktualizace/f9196>



4. RECOMMENDATIONS

The recommendations arising from the ClimArchi.Net project highlight the need

- Connecting ministries, experts and end target groups dealing with law-making, supporting financial, professional instruments and their implementation (level of the cities & municipalities).
- Defining objectives and strategies resulting in carbon neutral buildings and the process leading to the fulfillment of this strategy
- Link the strategy to the objectives of digitization (simplification and traceability)
- Long-term support of communication and visibility,
- Long-term support for creating an environment in the area of sufficient capacities (experts, materials and technologies)
- Long-term support for content updates (technological, political, financial, sociological development).

4.1. Public administration at the level of ministries

- Elimination of departmentalism at the ministry level (in order to ensure uniform coordination). It is necessary to move from a linear economy (programs) to circular economy. An example of this is the establishment of the Austrian Federal Ministry, which deals with climate, environment, energy, mobility, innovation and technology.
 - At present, it is no exception that more than a single grant scheme is suitable for the implementation of one construction project, while one scheme closes the opportunity to achieving other SDGs objectives due to its specific conditions
- Allocating a budget for restructuring and setting up a new scheme
- Financial support needed to unify the assessment methodologies applied by the individual ministries (Ministry of the Environment, Ministry of Industry and Trade, Ministry of Regional Development, Ministry of Labour and Social Affairs, Ministry of Education and Sports, Ministry of Agriculture)



- Defining a uniform methodology for carbon-neutral buildings in the conditions of the Czech Republic. At present, there is no clear interpretation and there is no consensus on this interpretation.
- Appoint a single sponsor (for SUSTAINABILITY)
- Reduction in administrative burden (it is no exception that one object is suitable for more grant scheme while another scheme closes the opportunity to achieving a possible goal)
- Support for the programs and capacity building at all levels in the field of innovation leading to carbon neutrality of buildings. There is a clear consensus as to the **FORMATION OF A MULTI-DISCIPLINE PROFESSIONAL TEAM** including a product designer. (The program output unification can have a form of **renewing the concept of ČEA - Czech Energy Agency, whose status will be apolitical and the objective of this organization will be a cross-sectional analysis of energy and other environmental project outputs starting from nuclear energy, renewable and alternative energies and structures consuming energies such as buildings, transport and industries.** The output will be a recommendation intended for individual government departments)
 - Evaluation of the market demand (volume of investments), needs to construct new buildings or reconstruct already constructed ones with regard to their carbon footprint from the point of view of the life cycle of buildings financed from public investments.
 - Ensure the usability of outputs of completed projects implemented with the support of national and European funds. Once the financial support is exhausted, there is often no follow-up work in such projects on the achieved results. The project results end up in the archives of the companies that participated in its implementation. From this point of view, it is necessary to ensure:
 - Funds to obtain the individual project outputs and to link these outputs to defined objectives/strategies/tools
 - Updating these outputs and taking them into account in the current political and economic conditions with regard to the life cycle
 - Uniform interpretation/procedure/criteria resulting in carbon neutral buildings



- Uniform channel for distributing the methodologies and auxiliary tools - CALL CENTER with personal support
- Opening of a LONG-TERM program of uniform support for contracting authorities in the field of carbon-neutral buildings
 - Allocating funds for methodological guidelines and their visibility for the end groups (ČKA, ČKAIT, cities & municipalities)
 - Organising a communication campaign with reference to tools (e.g., mobile application) leading to a quick evaluation of the plan (defining the needs of the expert team)
 - Ensuring regular updates during the PROGRAM PERIOD
 - of the professional content and conditions
 - Operation
 - Materials (reduction in energy demand of built-in products with respect to the LCA)
 - Technologies (reduction in energy demand of built-in products with respect to the LCA)
 - Financial instruments (grants, taxonomies, ESG)
 - Database of experts and professional companies
 - Reducing the administrative burden of experts in the preparation and implementation of buildings funded from the public budget.
 - Ensuring continuous and long-term incentives for the development and implementation of innovations leading to low-carbon and circular economy

4.2. Public administration at the level of regions, cities & municipalities

- Unification of information platforms, simplification of search for necessary information
 - The "Sustainable Architecture Contracting Authority's Guide" application leading to carbon neutrality and independence from fossil energies.
 - Following up on the strategy of urban & municipal development, energy supply and distribution
-



- Goal> Easy orientation in the process of project preparation and procurement with the requirements for Life Cycle Assessment, EU Taxonomy and ESG requirements
- Defining professional capacities and financial resources for the development (mobile guide to proper procurement - application)
- Defining professional capacities and financial resources for pilot testing (mobile guide to proper procurement - application)
- Defining professional capacities and financial resources for updates (mobile guide to proper procurement - application)

4.3. Czech Chamber of Architects

- The ČKA / ČKAIT professional chambers should put carbon-neutral buildings on their agenda. Disseminate requirements for these buildings with a reference to strategic documents of the state in a comprehensible (uniform) amongst the members and develop a library of examples of good practice ("White Papers").
- Set up an agreement between the professional chambers
- Introduce a manner of meeting requirements of the state
- Put pressure on raising funds for education and training materials
- Recommendations of energy specialists - to summarize the recommendations in *OneStopShop, Centrum pasivního domu, z.s. received a grant from LIFE Clean Energy Transition (LIFE-2021-CET) - Integrated Home Renovation Service program, as part of which it will continue defining suitable reconstruction procedures and methods in order to reduce energy demands of already constructed buildings*
- The preferred form of providing information is the library of Methodical Guidelines of professional chambers, expert seminars and transfer of experience using examples of good practice (video presentations / podcasts).
 - PERSONAL TRANSFER
 - The library of good practice should reflect the condition of the buildings with regard to their operation (usability, economic complexity, healthy indoor environment, etc.) - the portal <https://climarchi.net>, which was developed within the project, can be used



to make the integration of innovative architecture solutions visible. Presentations from professional conferences and results of professional excursions are posted on the portal (chapters of the ClimArchi.Net project)

- The selection of suitable examples must be based on multi-disciplinary criteria.
- Education and training of experts including an increase in the% representation of experts in professional chambers who have knowledge in the field of carbon-neutral building design.

Goal settings:

- ? % by 2025
- ? % by 2030

5. CONCLUSION

The topic of sustainability for keeping acceptable living conditions for the humanity is very broad.

The lack of a long-term strategy and its communication towards the society slows down the process of implementing adaptation and mitigation measures, making transformation more expensive both in the construction sector and in the society as a whole.

A different approach of individual government departments does not provide sufficient motivation for necessary changes in the professional or general public.

The recommendation is to unify the outputs and to interconnect them. Possible steps towards this goal.

- One agency of the type of the abolished Czech Energy Agency, established by the state with an allocated budget, defines objectives and not subject to political assignment.
- Unification of ministries and linking social, technical, energy and economic aspects. Getting inspiration from the Austrian Federal Ministry having the competence to address climate change, the environment, energy, mobility, innovation and technology.



6. LIST

6.1. List of sources

Sustainable Architecture Information Platform <https://climarchi.net/cz>

Circular Economics in construction - Ing. arch. Pavel Martinek, Member of the Board of the European Council of Architects - ACE

ClimArchiNet Round Table 1 and expert team outputs (21st January 2021): <https://www.youtube.com/watch?v=isc0JqeOHJg>

ClimArchiNet Workshop 1 and outputs of the expert team (18th March 2021): <https://www.youtube.com/watch?v=RqwjJTbhNOo>

ClimArchiNet Workshop 2 and outputs of the expert team (22nd April 2021): <https://www.youtube.com/watch?v=q-ce2NmeTfl&t=847s>

ClimArchiNet Workshop 3 and outputs of the expert team (25th February 2022): <https://www.youtube.com/watch?v=XD7EUMkBYwY>

ClimArchiNet Final Round Table 2 (1st April 2022): <https://www.youtube.com/watch?v=ZAljpRn1Mpc>

CPD International Conference on Building & Sustainability (30th November 2021) <https://konference.pasivnidomy.cz>

ClimArchiTRIP Berlin - study trip 20th-22nd April 2022 <https://climarchi.net/cz/novinky/clanek/51/climarchitrip-6-zkusenosti-z-berlina>

CAT_2022-03-09_Report_DecarbonisingBuildings

The quality public construction portal, <https://kvest.cz/>, a web tool supporting awards of quality and sustainable public construction projects, developed as an output of the TAČR TL02000357 project - Quality and sustainable public construction: functional specifications, decision-making and communication in construction projects.

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