



Main principles for setting up energy efficiency refurbishment support scheme for residential buildings

Czech and CEE case studies

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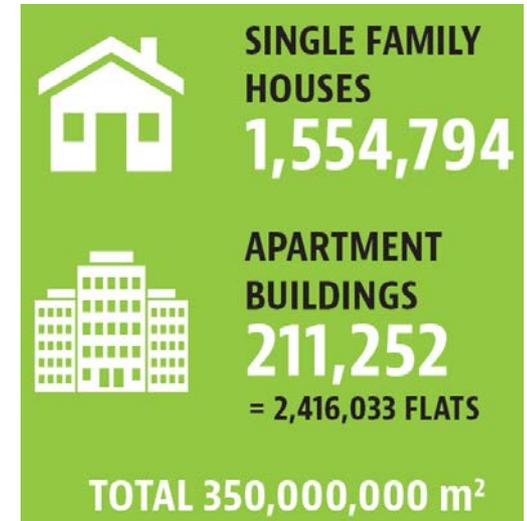


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Housing in the Czech Republic

- 10,4m people
- **55 % in multi-family houses**, 43 % in single-family houses
 - 75 % live in owner occupied
 - 40 % served by district heating
- Average age of buildings: 52y (MFH)
49y (SFH)
- Low energy prices
vs. high share of income on energy expenses



Renovation programmes in Czechia

- Fragmented (6+ programmes)
 - Type of the building
 - Type of the owner
 - Type of the measure (renovation/construction/source replacement)
 - Location
 - Various responsible institutions
 - Different conditions and level of support
- Significantly varying results
- But now generally successful
- New Green Savings being the most advanced



Situation in Czech Republic

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	 Single family houses	 Apartment buildings	 Public buildings	 Commercial buildings
Renovation in Prague	New green savings programme	New green savings programme	OP Environment OP Prague	ENERG
Renovation out of Prague	New green savings programme	Integrated Regional OP	OP Environment	OP Entrepreneurship and Innovation for Competitiveness
New building	New green savings programme	New green savings programme	OP Environment	OP Entrepreneurship and Innovation for Competitiveness
Replacing sources	OP Environment Priority Axis 2 New green savings programme	Integrated Regional OP New green savings programme	OP Environment	OP Entrepreneurship and Innovation for Competitiveness
Others	Dešřovka	Panel Jessica	Efekt	Efekt



New Green Savings: How did it start

- In 2008, **Czech Republic's new government decided to invest its revenues from Kyoto credit** (Assigned Amount Unit, AAU) sales to support energy savings in residential sector
- Managing authority was Ministry of Environment and administering body was State Environmental Fund
- As renovation of multi-apartment buildings was already being supported by other programme (so called Panel) under Ministry for Regional Development whose responsibility included also a housing policy, a focus of the new programme was politically agreed to be on **single family houses**

Ways to design the scheme

- A supervising body (managing board) was set up, having about 10 members – key people from MoE and SEF
- MoE responsible for setting up main parameters
- SEF responsible for setting up administration processes
- **Time frame of cca 3 months to develop the scheme (and for governmental approval), another 3 months for finetuning**
- Call for applications opened on 1 April 2009

Meanwhile...

- **Ensuring upstream financing...**
- Selling AAUs to buyers, at the first stage mainly to Japan, later also to Spain, Austria, World Bank and others
- Thanks to the well-designed programme, Czech Republic sold the most AAUs of all the countries and for the highest average price (the first transactions for 10 euro/AAU)
- About 1 bln euro raised for a country with 10 mil. inhabitants
- 95 % going for the actual support, 3 % for administration and 2 % for publicity and marketing

The first steps

- Research of beneficiaries market (how much houses we have, how much does it cost to renovate one, how much energy and money it can save, why it is not happening)
- **What is a needed level of support** – sociological pool suggested the breaking point is at about 30–35 % subsidy)
- **What is an absorption capacity** at the given level of support – basically large
- Important aspect for financing parties: Greening – what are the costs of additionally saved ton of carbon dioxide
- **Research of implementing capacity** (project designers, energy specialists, construction companies, producers of materials and technologies) – available but market still needs to mature
- Foreign experience: two day study visit at KfW Frankfurt

Main criteria for supported projects

- **Technically and economically reasonable requirements but more progressive than business as usual** (public funds should be used to shift the market towards higher quality)
- Previous experience from setting up criteria for public building renovation in OP Environment (2007–2013): first reaction “you will not get any projects, this is too strict”, applications for 8 bln CZK while allocation being 1 bln (lesson learned: market always complains but follows)
- **Several (three) levels of support depending on energy quality of the project**
- Energy savings combined with local renewables

Energy performance criteria

- Check everything vs. look only at overall performance – compromise between both needed
- Quality of envelope is the most important – check U-value of renovated components or average U-value (or energy demand for space heating that incorporates also solar gains and ventilation with heat recovery)
- Then you may check (primary/delivered) energy consumption as KfW does but we decided not to as the programme was focused mainly on space heating savings and local renewables got their additional support
- Also in CZ, calculation of energy performance is more creative than in Germany but at level of U-value or energy demand for space heating is still quite accurate, at level of primary energy consumption less so
- **Level of final energy performance of building as the main criteria**
- **Reached savings an important but only supplementary criteria** (you shouldn't support relatively new houses but the state of the building before measures cannot be ever sufficiently checked)



How to calculate financial support

- % of actual costs works in Germany but wouldn't work on CZ (how do you ensure that you don't get swimming pool within the invoice for thermal insulation?)
- That is why a **fixed amount per certain well measured unit** was chosen, in 2008-2010 per sq meter of floor area, now per sq meter of realised measure (insulated facade, replaced window etc), or as fixed amount per unit technology (boiler, solar collectors)
- This avoids overpricing
- Another important aspect: **Applications can be submitted prior to implementation of measures**, the project is checked and the subsidy amount is kept aside for the project (18 months for renovation), **after completion of the project, the amount is transferred**

How to ensure quality

- 2008: List of supported materials and technologies (all products compliant with product requirements can be registered, applicant then chooses from the list)
- Now: This list is only recommended, if you choose different product you need to provide full list of documents
- 2008: List of qualified providers (all companies with basic experience could register) but it created a false feeling of quality guarantee
- **Now: This list was canceled and replaced by a final report of qualified technical supervisor**

Administration

- Decision to involve retail banks in the administration was good, anybody could file application at his/her bank
- But long term instability of the programme caused that banks trained their personnel (one specialist per branch) but in one year time the programme stopped, banks got disappointed
- Banks are more cautious to get involved in dealings with state as a result

How the programme evolved

- April 2009: the programme started, however only few applications were submitted
- That was due to large gap between programme requirements and usual market conditions
 - project design and energy performance calculations needed
 - invoices (paid VAT and income tax) required for all works and materials
 - long administration by SEF
- September 2009: First modification: support goes also to project design and energy calculation – good move
- And also to partial renovation (people don't need that high investment upfront) – but due to set up of the programme (support per sq meter of floor area), some projects got 100 % subsidy – generally welcomed but in given circumstances was a bad move
- And newly the support went also to multi-apartment buildings – bad move as it started to suck the programme quickly
- SEF didn't have an instant sense of how many applications were accepted
- As a result the programme was sucked, ended unannounced in October 2010 with some surplus applications compared to available allocation (that lead to harsher checks and refusal of applications – further instability)

New life for “New Green Savings” Programme

- New government decided to continue the programme in a modified version (“old one had a good core but was administered badly, we do it much better”)
- Important aspect was the political power of applicants who prepared but not submitted or got rejected applications
- In 2013, the programme was slightly redesigned (support calculated as fixed amount per sq meter of a measure) though long administration (up to nine months!) and stop-and-go way of accepting applications meant low interest
- **Important step forward: support given also to mechanical ventilation with heat recovery unit**

2015 and futher (continuous programme born)

- In 2014, the programme was redesigned again (but under pressure of Chance for Buildings not really much), administration was simplified (not checking every little detail) and shortened (down to 3 weeks for formal check and another 3 weeks for final approval)
- The programme gained more interest and allocation was used up in three months
- **For 2015 on (until 2023) the minister announced continous programme with stable conditions which is what the market and building owners need to gain confidence and thus lower transaction costs and improve project quality**
- Germans told us in 2008 as the main lesson, in seven years we got the message

Main lessons – also for Armenia (1)

- Subsidy as fixed amount per sq meter of renovated envelope or replaced technology unit – avoids overpricing
- Support to partial renovation lowers upfront finances needed to enter the programme – but a staged deep renovation needs to be ensured by progressive component requirements (avoiding lock-in effect)
- Trustable promise of funds before implementation of the project, transfer of funds after implementation – gives confidence to buildings owners but minimize risks for the state for not implementing the project
- Trust project designers and energy specialists – check main criteria/calculations not every single detail, thus be quick in administering the project (3 days in Germany, 3 weeks in CZ is acceptable)
- Though calculation methodology should be clear, if methodology for EPC is not sufficient, make it more accurate by complementary requirements

Main lessons – also for Armenia (2)

- Continuous programme with stable conditions
 - gives space for building owners to plan their renovation in the usual renovation cycle
 - allows to plan for renovation when applicants own/cheap financing is available
 - gives time to prepare quality projects, each building is different and a few months are needed, it may also shorten the payback times
 - could allow banks to develop a complimentary mortgage products
 - lowers pressure on administration, avoids hypes at the beginning and end of the call
- Goes against political nature, ministers are reluctant to praise their predecessors for something good and it is hard for them to avoid temptation to do “their” changes into the programme
- This is hopefully replaced by praising from EE trade unions



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Thank you for attention!

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Chance for Buildings is an alliance by leading trade associations that supports energy efficient construction. It brings together **Czech Green Building Council**, **Passive House Centre**, **Mineral Insulation Manufacturers Association**, **EPS Association** and **Energy Service Providers Association**. It represents over 300 companies across the entire value chain of building construction and renovation. Chance for Buildings aspires to reap the crucial societal benefits of energy efficient buildings. We advocate for favourable policy and economic incentives, including proper implementation of relevant EU directives in the Czech Republic.

Founding partners



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The New Green Savings – closer look

- Since 2014 more than **EUR 150m (CZK 4bn)**
- 18357 projects -> **on average 8400 EUR per project**
 - 32 % shallow renovation, 46 % complex deep renovation,
- Subsidy level depends on the depth of renovation:
 - Covering **on average 30-40 % of eligible costs**
 - Envelope insulation: EUR 18-30,- /m²
 - Windows: EUR 78-140,- /m²
 - Floors: EUR 26-45,- /m²
 - Ceiling: EUR 12-21,- /m²
 - Boilers, heat-pumps, solar panels:
up to EUR 3700,-



**Nová
zelená
úsporám**

CHANCE FOR BUILDINGS



Example

- Partial SFH reno (envelope)
- Total costs: EUR 14 000
- Subsidy: 40% + project
- Savings:
62 %



Konstrukce	Původní stav	Zateplení Fasády		Zateplení Střechy		Zateplení Střechy + Fasády	
		Tloušťka izolace (mm)	U (W/m2K)	Tloušťka izolace (mm)	U (W/m2K)	Tloušťka izolace (mm)	U (W/m2K)
Fasáda	1,37	180 mm FKD S	0,18			180 mm FKD S	0,18
Střecha	0,31			200 mm Unifit 032	0,14	200 mm Unifit 032	0,14
Měrná potřeba tepla na vytápění	124 kWh/m2a	Úspora 29%	87 kWh/m2a	Úspora 26%	92 kWh/m2a	Úspora 62%	47 kWh/m2a
Náklady na úsporná opatření	-	190 000 Kč		198 000 Kč		388 000 Kč	
Dotace	-	Dotace 56 700 Kč + 8 500 Kč dotace na projekt		Dotace 59 400 Kč + 8 900 Kč dotace na projekt		Dotace 155 000 Kč + 23 000 Kč dotace na projekt	



Some technical details (1)

- **A. Improving energy performance of buildings**
 - support for envelope renovation – replacement of windows and doors, insulation of outer walls, roof/ceiling, floor
 - higher support to overall renovation, partial renovation possible
- **B. New passive energy single family houses**
 - two levels of support to new high energy efficient new build
- **C. Effective technologies**
 - support to replacement of coal fired boilers for effective biomass boilers, heat pumps or condensating gas boilers
 - replacement of electricity heating for heat pumps
 - installation of solar thermal collectors
 - installation of mechanical ventilation with heat recovery unit
- **D. Project design and energy performance appraisal**

Some technical details (2)

Sledovaný parametr	Označení [Jednotky]	A.0	A.1	A.2	A.3
Měrná roční potřeba tepla na vytápění po realizaci nebo Průměrný součinitel prostupu tepla obálkou budovy	E_A [kWh.m ⁻² .rok ⁻¹]	bez požadavku	≤ 90	≤ 55	≤ 35
	U_{em} [W.m ⁻² .K ⁻¹]		nebo		
			≤ 0,95 $U_{em,R}$	≤ 0,85 $U_{em,R}$	≤ 0,75 $U_{em,R}$
Měně stavební prvky obálky budovy	U [W.m ⁻² .K ⁻¹]	$U \leq 0,9 \cdot U_{rec,20}$	dle požadavku ČSN 73 0540-2 a vyhl. č. 78/2013 Sb.		
Procentní snížení vypočtené měrné roční potřeby tepla na vytápění E_A oproti stavu před realizací opatření	[%]	≥ 20 %	≥ 40 %	≥ 50 %	≥ 60 %