



# BUILD UP SKILLS

ENERGY TRAINING  
FOR BUILDERS



## BUILD UP Skills Slovenia - ROADMAP

**IEE Skills4SB.SI** - Building Skills for Sustainable Building in Slovenia

Contract N°: IEE/11/BWI/519/SI2.604361,  
project duration: 18 months (from Nov. 8, 2011 – to May 7, 2013)



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# Project Summary

## BUILD UP Skills Slovenia

### Goals:

- **Intensive upgrade of existing skills** of **craftsmen** working on NZEB buildings
- By approaching **continuing education/training** and an **upgrade in the initial education**.

### Partners:

- ZRMK - Building and Civil Engineering Institute ZRMK (Co-ordinator)
- CCS - Construction Cluster of Slovenia
- OZS - Chamber for Crafts and Small Business of Slovenia
- IZS - Slovenian Chamber of Engineers
- SCNM - School Centre Novo mesto
- CPI - Institute of the Republic of Slovenia for Vocational Education and Training



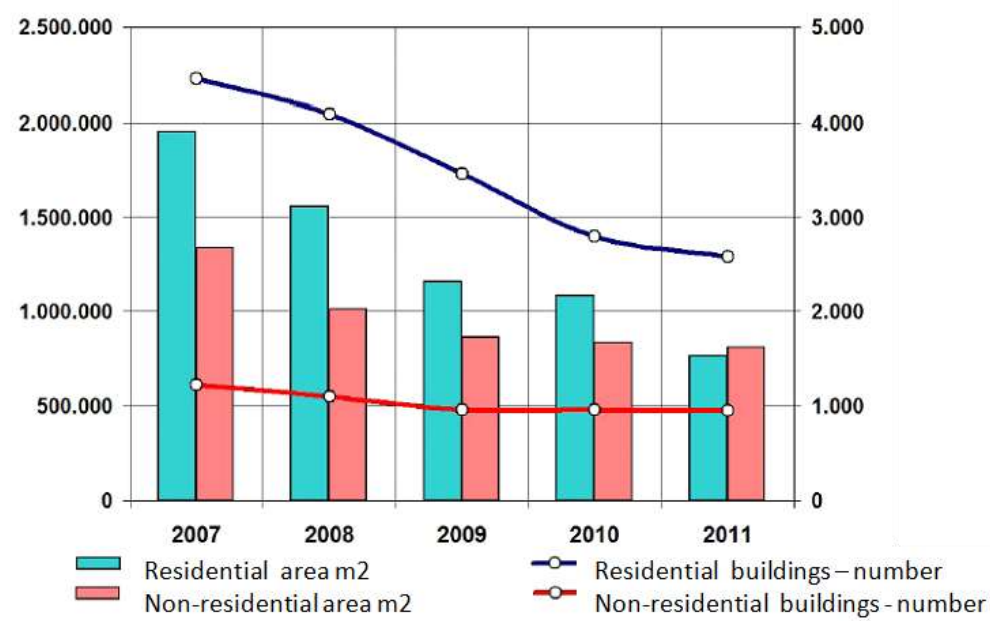
# Background - Analysis of the industry



The **Range** is reduced to **50%**

## Building permits for residential and non-residential buildings

Slovenia, 2007-2011 (Source: SORS, 2011)



**90%** of the **largest** construction companies went into **Bankruptcy**.





# Background - Analysis of education and training system



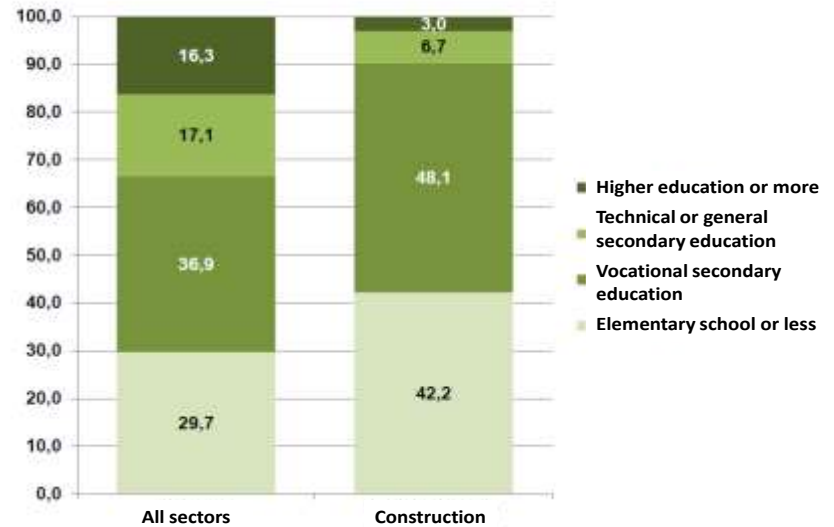
Still **50.000 persons** in the Industry

**Vocational** education is desired

Craft in activities in construction sector in 2012 Members of Chamber of crafts and small bussines Source: OZS, 2012	Nr. of legal persons	Nr. of employees
Organisation of construction works in buildings	2	6
Construction of residential and non-residential buildings	2.433	17.292
Road construction	146	3.870
Construction of bridges	48	401
Construction of infrastructure for liquids and gases	166	1.721
Construction of infrastructure for ICT	17	206
Demolition works	3	-
Preparatory ground works	408	905
Instalaion of electricity networks and systems	1.860	7.286
Installation of water, gas and heating systems	1.361	4.016
Other installation in construction works	544	1.674
Fasade, render and plaster decoration works	614	923
Installation of windows and doors	1.966	1.699
Placing of floor and wall coverings	1.700	1.599
Glasier works	125	191
Painter	1.220	1.354
Other finalisation works	2.152	3.228
Installation of roof structures and roofer works	585	1.351
Construction of engineering structures (non-building)	15	250
Other specialized construction works	1.216	2.838
<b>Total (average: 3 employees/legal person)</b>	<b>16.581</b>	<b>50.810</b>

## Job vacancies – according to educational level for 2011 (in %)

(Source: The National Institute of Republic of Slovenia for Employment)



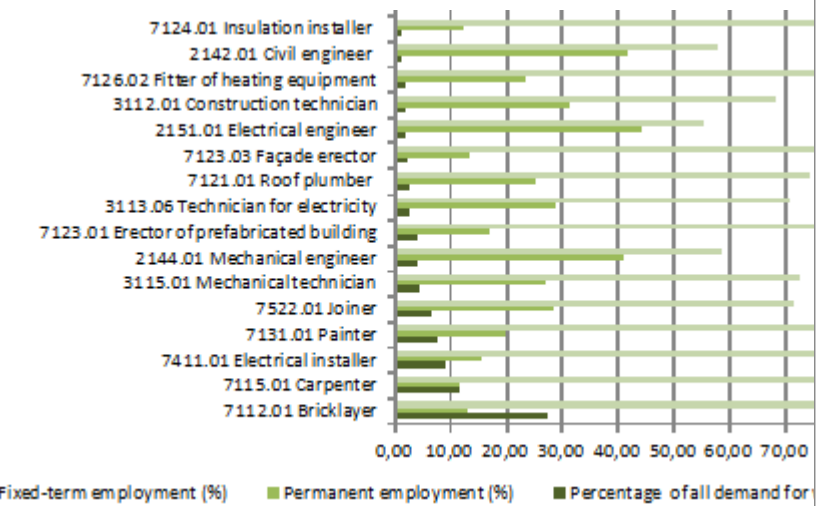
# Background - Analysis of education and training system



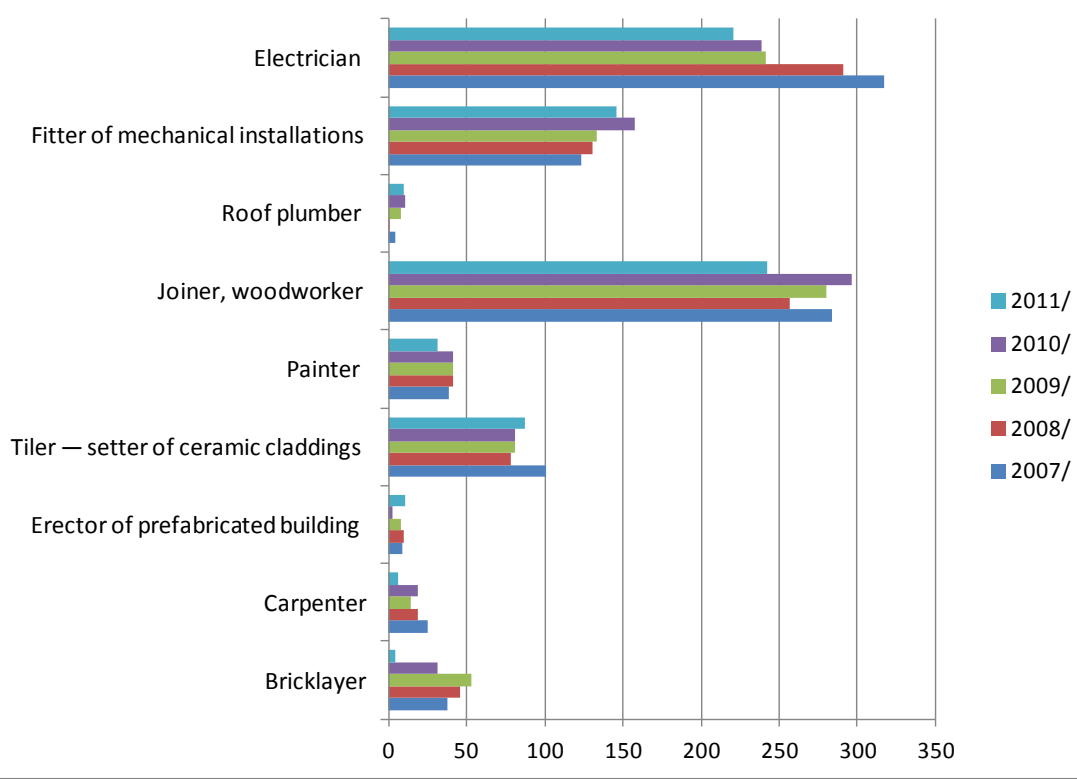
When **Demand exceeds** the **Offer!**

How to train **3 Bricklayers** in **4 SCHOOLS?**

**Structure of demand for workers in the area of energy efficient construction by year and by employment period, 2007 – 2011**



**Enrolment in 1st year of secondary VET education**



Question:  
Is **NZEB Building** a **HIGH TECH** or what?



# Background - Analysis of education and training system



What a relief: **Informal** trainings

No.	Item / Scope	No. of Participants	Total hours
G2	CONSTRUCTION MATERIAL	720	4.400
	Bricks	350	2.800
	Aerated Concrete Blocks	120	600
	Hydro Insulation	250	1.000
G3	THERMAL INSULATION SYSTEMS	1.585	12.680
	Thermal Insulation	760	6.080
	Facade Systems	825	6.600
G4	DOORS, WINDOWS AND SHADING SYSTEMS	425	3.400
	PVC Doors and Windows	220	1.760
	Wooden Doors and Windows	120	960
	Roof Windows	85	340
	<b>TOTAL</b>	<b>2.730</b>	<b>20.480</b>

Source: OZS - Chamber for Crafts and Small Business of Slovenia , 2012

Fact:

**NZEB Building** is a **HIGH TECH**.

**Conclusions:** The existing **Vocational education system need to adapt** to real circumstances and become:

-**more professional** in terms of technical knowledge

-**more practical** – to include practice lessons and theory in balance

-**more efficient** in terms of time - shorter education period

-**more flexible** in terms of following fast changes circles in technology.



# Drivers - Renovation Potential 1 – Public Buildings

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- **EE national targets in draft NEP 2030:**

EE to be improved according to NZEB Standards:

- **50%** of new and renovated by **2015**
- **100%** new and renovated by **2018**

Fact:

**NZEB Building** is a **HIGH TECH**.





# Drivers - Renovation Potential 2 – Residential Buildings

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Item	Value	Unit
AREA of residential buildings to be renovated	50.000.000	m <sup>2</sup>
Annual EC	10	GW <sub>h</sub>
Annual EC	1.000.000.000	EUR
Average EC/m <sup>2</sup>	200	kWh/m <sup>2</sup> .a

Table 54: Frequencies of 10 building types in 2009

Building type	number of buildings	number of apartments	living space in 1000 m <sup>2</sup>	TABULA reference area in 1000 m <sup>2</sup>
SU.H.01 (until 1970)	256.125	276.993	24.792	27.271
SU.H.02 (1971 – 1990)	90.189	96.958	9.718	10.690
SU.H.03 (1991 – 2002)	122.862	128.048	12.901	14.280
SU.H.04 (2003 – 2008)	23.961	24.668	2.844	3.129
SU.H.05 (from 2009)	146	158	14	15
MU.H.01 (until 1970)	17.650	178.890	9.344	10.278
MU.H.02 (1971 – 1990)	3.165	66.905	3.216	3.538
MU.H.03 (1991 – 2002)	3.074	57.262	2.909	3.200
MU.H.04 (2003 – 2008)	1.408	21.630	1.274	1.401
MU.H.05 (from 2009)	18	1.161	71	78
Building Stock total	518.598	852.693	67.164	73.881

Source: Registry of buildings (RE3)

Source: Dr. Marjana Šijanec Zavrl, ZRMK za GIZ PFSTI: Študija energetske prenovе fasadnih sistemov stanovanjskega stavbenega fonda

Fact:  
**NZEB Building is a HIGH TECH.**



# Drivers - Renovation Potential 2 – Residential Buildings

Turning **20I** buildings into **1.5I NZEB** buildings

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Item	Year	Year	Year	Year	Year	Year	Year	Year
	2013	2014	2015	2016	2017	2018	2019	2020
Total AREA (1.000m2)	50.000	49.000	48.000	47.000	46.000	45.000	44.000	43.000
EC (1.000kWh)	10.000.000	9.815.000	9.630.000	9.445.000	9.260.000	9.075.000	8.890.000	8.705.000
EC (EUR)	1.000.000.000	981.500.000	963.000.000	944.500.000	926.000.000	907.500.000	889.000.000	870.500.000
Price/EC unit (EUR/kWh)	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
RENOVATION AREA	1000	1000	1000	1000	1000	1000	1000	1000
Annual Rate	2%	2%	2%	2%	2%	2%	2%	2%
Annual Savings in EC (EUR)		18.500.000	18.500.000	18.500.000	18.500.000	18.500.000	18.500.000	18.500.000
Total Savings in EC (EUR)		18.500.000	37.000.000	55.500.000	74.000.000	92.500.000	111.000.000	129.500.000
Annual Costs of Investment (EUR)	<b>150.000.000</b>	<b>150.000.000</b>	<b>150.000.000</b>	<b>150.000.000</b>	<b>150.000.000</b>	<b>150.000.000</b>	<b>150.000.000</b>	<b>150.000.000</b>
Total Costs of Investment (EUR)	150.000.000	300.000.000	450.000.000	600.000.000	750.000.000	900.000.000	1.050.000.000	1.200.000.000

Investment Parameters: Seems like a **GOLDEN OPORTUNITY** in Crisis

Item	Value
NPV	277.432,21 €
Period	10 years
Disc. Rate	2,1%

**Conclusion:** That's why we need to **BUILD UP SKILLS (ROADMAP)**

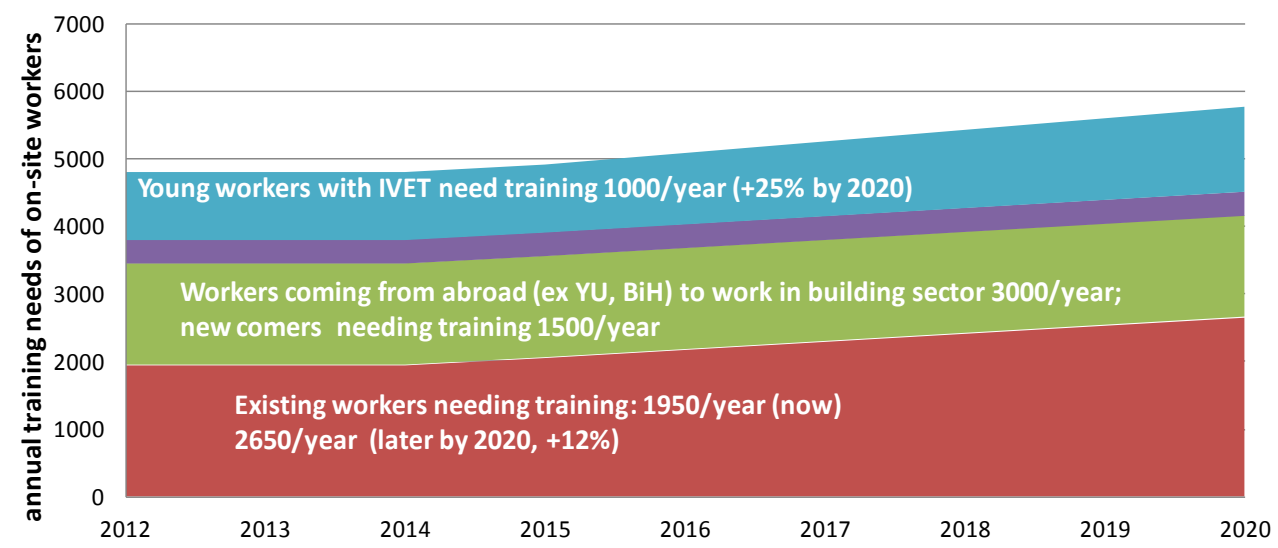
Source: Dr. Marjana Šijanec Zavrl, ZRMK za GIZ PFSTI: Študija energetske prenove fasadnih sistemov stanovanjskega stavbenega fonda

# ROADMAP

## Estimation of training needs



**Annual training needs of on-site workers in Slovenian nZEB sector**



- annual training needs of existing workers
- annual training needs of new foreign workers (new comers from ex YU, BiH)
- need training - new workers coming from other sectors (new comers in the sector)
- annual training needs from young workers with IVET - need additional training



**Attitude:**  
**NZEB Building is a HIGH TECH.**

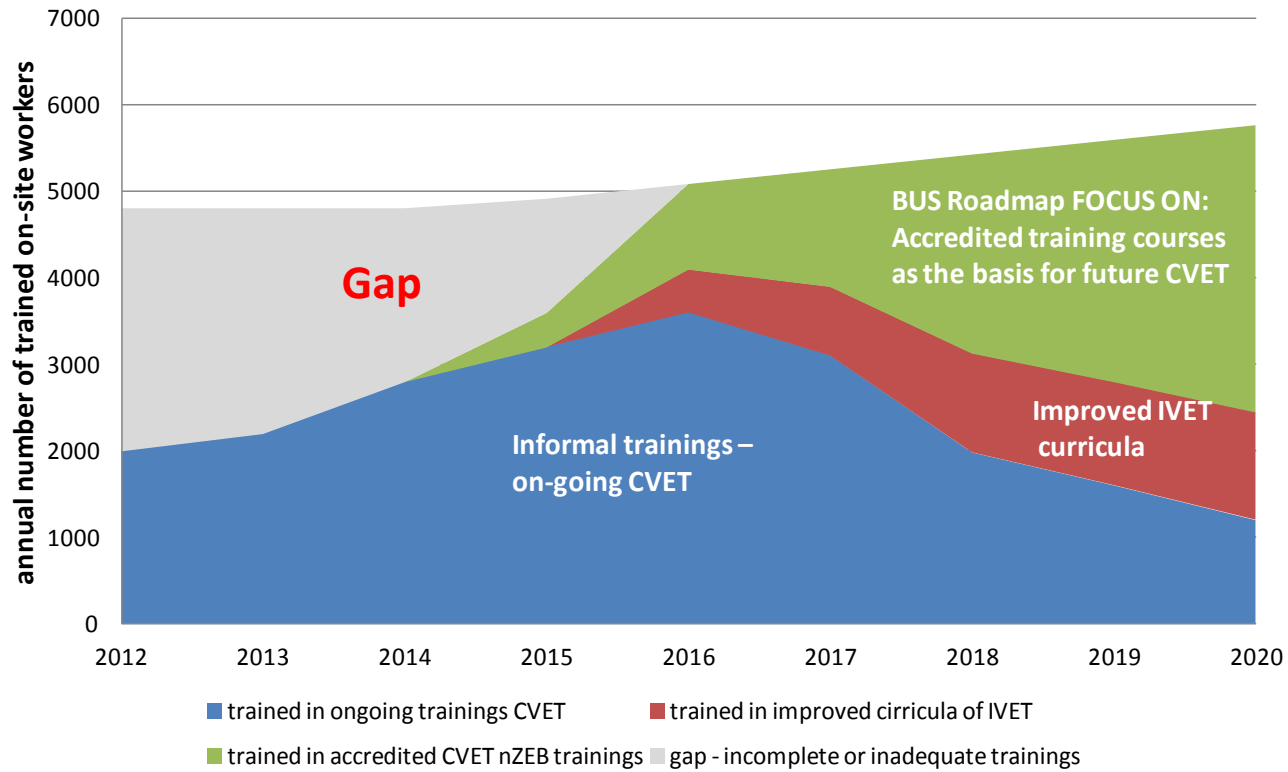
# ROADMAP

## Estimation of future trainings



**Annual trainings for on-site workers for nZEB - preliminary plan**

**Attitude:**  
**NZEB Building is a HIGH TECH.**





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# ROADMAP

## Accredited Training Course Model – Draft

### 1st Module – BASIC KNOWLEDGE on nZEB

All are implemented by accredited training providers, accreditation is awarded by national committee formed of stakeholders from national qualification platform, trained workers get confirmation of attendance to the 1st module

### 2nd Module – SPECIFIC VOCATIONAL KNOWLEDGE

**A SUB-MODUL**

BUILDING ENVELOPE

**B SUB-MODUL**

HVAC  
RES

**C SUB-MODUL**

ELECTRICAL FITTING  
CNS, IT,  
RES

### 3rd Module – SPECIALIZED VOCATIONAL SKILLS

**Conclusion: Certification Required**

**Attitude:**

**NZEB Building is a HIGH TECH.**





# ROADMAP - Conclusions



## Core activities by 2020

- Further **development of national qualification platform**
- **Preparation** and implementation **of support policy**
- **Development of** comprehensive **lifelong learning programme**
- **Formal VET support.**
- **Non-formal VET support**
- **Accreditation** of providers of non-formal VET trainings
- **Certification** (voluntary scheme) of workers
- **Awareness raising**, promotion and dissemination nationwide

**Attitude:**

**NZEB Building** is a **HIGH TECH**.