Saving Baltic buildings through EPC+ Ecosystem
Renesco’s Success in Latvia as an example
a unique problem with a unique solution
the ECP+ Ecosystem

- EPC+ = RENESCO LAB
- STRONG LONG TERM STATE POLICY
- FORFEITING FUND
Building Renovation and Energy Efficiency Bureau

Advocate for home owners/residents in Multi Family dwellings.
"The need to renovate housing, and particularly multi apartment blocks, is enormous and improvement of the energy efficiency of such buildings is both a Latvian and EU priority objective." January 2012 EU study
Somewhere in the North of ? ...extreme urban fuel poverty
Figure 1: Severe housing deprivation rate across the EU, 2009

Source: Own calculations based on EU-SILC 2009 – revision 1 of August 2011.

Notes:
Severe housing deprivation refers to the percentage of the population in a dwelling which is considered as overcrowded and exposed to at least one of the following three housing deprivation measures: (1) a leaking roof or damp walls, floors, foundations or rot in window frames or floor; (2) neither a bath, nor a shower, nor an indoor flushing; or (3) too dark.
Housing situation

Facts
Latvians live in $\pm 17.5m^2$ vs Danes 53 $m^2$ (source: STATINFO).

Current housing
no new housing stock for 85% of population
  too little and poor quality
poor protection against weather and is deteriorating rapidly

Conclusions:
Low supply of affordable, decent quality housing apartment
deterioration is increasing.
What will happen in 5 years, 10 years if not addressed comprehensively?

Solution
Insulating buildings protects them against moisture and temperature swings, stops corrosion and very significantly prolongs their lifespan.
Internal parts are worn

Damaged roofs

Obsolete engineering networks
External parts are corroding due to the effects of weather

Crushed panel joints

Collapsing structures
Current ventilation system....

‘natural’ ventilation

• To little ventilation with poor indoor climate (fungus problems)
• Ventilates not enough in mild weather conditions, too much in severe weather conditions
• High heat losses (ventilation losses account for 30-50% of all heat losses in standard renovated buildings)
Vele partijen vormen de bouw

- Huurder, gebruiker
- Klant/ opdrachtgever
- Ontwerper/ adviseur
- Bouwer
- Industrie/ materialen

- Makelaar k/h
- Bank/ financiën
- Gebruiker

- Eigenaar
- Ontwikkelaar
- Beheerder

- Architect
- Bouwfysicaadv.
- Adviseurs ov.

- Onderaannemers
- Installateur
- Aannemer
- Elementen

- Demontage
- Recycling
- Groothandel

- Producten
- Groothandel (Wetgeving & Handhaving)

- Installatieadv.
- Overheid (Wetgeving & Handhaving)

- Bouw wereld
- Vastgoed wereld

Lineair proces
36 mil m² of multi-family dwellings, 90 mil m² public sector buildings

Conservative estimate 50%:
160kWh/m² reduced to 80kWh/m² = 80
or > 44 Million kWh/year for 70%

can pay for the comprehensive renovation and reduce CO2 production by 40%

5 Million cubic meters of gas saved
Renovated buildings

Valmiera, Gaujas 13 • Cēsis, Kovārņu 31
Facade
Roof
Staircase and entrance repair
Windows and Doors
Repair of balconies & loggias
Heat distribution system

Dynamic balancing valves

Thermoregulators with maximum 22°C setting
New hot water network and heat substation
Loose mineral wool in the attic covering new hot water and heating pipes

New networks placed inside ceiling insulation
new ventilation system

mechanized ventilation

- Fixed hourly air refresh independent of season or weather
- Healthy indoor climate in all seasons and all parts of the apartments
- Recovery of up to 90% of ventilated heat energy
- If geothermal heat pump is installed > free cooling in summer
20 years commitment to renovation

26 million m² of Soviet Era multi-family dwellings, of which only 75% are restored.
Total Investments and savings

- Money gained from heat savings
- Total
- Money spent for renovations
Kerkrade 153 woningen  Holland!
DAY 1
DAY 3
DAYS 6/7
Building Renovation and Energy Performance Contract - EPC+

Solution is to sell comfort instead of energy
Financing the deep retrofit through the Energy Savings Ecosystem
Clients:
a) Commit to a 20 year contract
b) Will consume and pay for a guaranteed quantity of energy for 20 years
c) Agree to a minimum price guarantee below current tariff

In exchange for
• Complete renovation
• 20 year guarantee on comfort and construction.
Guaranteed Savings principle

Before: 600 MWh/a

ESCO: 50% = 300 MWh/a + 50% = 300 MWh/a

After: 600 MWh/a

= 600 MWh/a
How are residents’ payments calculated?

1st step – average pre-renovation heat consumption is calculated:

<table>
<thead>
<tr>
<th>Heat + hot water + circulation losses MWh/year</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>620</td>
<td>598</td>
<td>578</td>
<td>636</td>
<td>608 MWh/year</td>
</tr>
</tbody>
</table>
How residents payments are calculated (2)

2nd step – adjustment according to price / temperature changes:

\[ ET_{A,s} = ET_B \times \frac{(TO_s - TI_s)}{(TO_B - TI_B)} \times \frac{SA_s}{SA_B} \]

Calculated payment to ESCO = pre-renovation heat consumption (608 MWh) \times \text{monthly average local district heating temperature} \times 60-80 Euro/ MWh
Housing renovation with ESCO and maintenance company

Payments for maintenance and services

Maintenance services, bills, accounting

Renovation, comfort

ESC0

Payments for heat energy

Water

Heating

50 %

Constructing company

Investor

Equipment delivery
Risks?

Investors (banks, funds etc.)

€

ESCO

Payment for guaranteed comfort

Bank requirements from ESCO:
• Guaranties of company owners
• Commercial pledge
• Rights to receive cash flows from the people’s payment for heat

Building or residents do not provide collateral or guarantees
If the company goes bankrupt

Investors (banks, funds, etc.)

€, LVL

Bank requirements to company:
• Guaranties of company owners
• Rights to company’s capital
• Rights to receive cash flows from the owners' payment for heat

Payment for guaranteed comfort

Building, nor residents, provide collateral of guarantees
identify ... remove regulatory and non-regulatory barriers to the use of energy performance contracting

...barriers include accounting rules and practices that prevent capital investments and annual financial savings for the whole life of the investment. Obstacles to the renovating of the existing building stock based on a split of incentives between different actors concerned should also be tackled at national level.

Eu directive 2012_27_EU Exerpt
A State Policy committed to long term support of EPC+ will:

• attract Long Term investment
  • Increase local content
  • Allow Pension Funds to invest
• attract Insurance Companies
  • increase verification quality
  • lower the cost of transactions as well as improve bankability
• create a pool of knowhow for public and business sectors

**align** the interests of business and finance to society’s:

implement speedy resolution solutions

clear rules and support for special cases
So how do we finance renovations though energy savings?
• pledges to buy receivables based on pre-defined criteria
• the Building Renovation and Energy Performance Contract
• buys receivables from Energy Service Provider
  • monitors underlying security-building
• holds these contracts by borrowing up to 70%
• sells bonds against portfolios
Building Renovation and Energy Performance Contract

- ESCO
- Legacy fund
- Bank
- Suppliers
- Building
- EPC+

Flow:
- Bank to Legacy fund
- Legacy fund to ESCO
- ESCO to Suppliers
- Suppliers to Building
- Building to Bank

Note: Pledge, Cash, Works are mentioned on the right side of the image.
“Building Renovation and Energy Performance Contract"
Benefits to owners and state and Europe
the solution to the unique problem

- Conservation and modernization increased:
  - comfort and health
  - building life by 30-50 year and 20 year guarantee
  - value of residences
- No financial or technical risks
  - receive profit share and >20 year all

- improved energy independence and balance of payments
- job creation in the energy services and construction sectors.

- energy
  - deficit reduced
  - security increased

ĒKU SAGLABĀŠANAS UN ENERGOTAUPĪBAS BIROJS
Ačiū!