Comprehensive evaluation of energy efficiency programmes: Focus on transaction costs

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Content

- Theoretical background
- Transaction costs of energy efficiency subsidy programmes
- Methods
- Results: Case example Operational Programme Entreprise and Innovation, Eco-Energy

Theoretical background

- When evaluating energy efficiency (or GHG emission reduction) programmes the analysis usually only compares the level of subsidy and the resulting effects (CO_2 savings, energy savings, etc.).

- In line with transaction costs theory, such evaluation leads to **suboptimal decisions**

- Besides the level of subsidy (as the major *cost* of the programmes) evaluation of public programme needs to include *transaction* costs of the programmes, too.

Transaction costs theory

What are transaction costs?

- Not a single and generally valid definition
- All actors in economy make their decisions under bounded rationality (new institutional economics)
  - All activities/contracts bring about transaction costs
- Transaction costs can be compared to friction in physics
- Some (two) of the definitions:
  - the costs of running the economic system Arrow, K. J. (1969)
  - transaction costs are all costs connected with the implementation of a contract, excluding production costs Pavel, J. (2005)

Transaction costs of energy efficiency subsidy programmes

- Arise on the side of the administration body and on the side of the recipient (applicant)
- Unsuccessful applications should be included, too (if evaluating the programmes as a whole)
- the transaction costs amount to 10 – 40 % of the project or investment

Organisation	Ex-ante	Implementation	Ex-post
Public administration	Design of the programme Technical assistance Administration of the programme – validation of projects	Validation and processing of the programme	Monitoring and verification Quantification results Settling of legal disputes
Subsidy recipient	Search for information and its assessment Initial negotiations Development of application Legal fees Bank fees (credit)	Negotiation of the contract, procurement, project validation	Monitoring Payment request Lawsuits

Methods to monitor transaction costs

- Analysis of structure and level of transaction costs (time and external services)
- Mixed method research
  - Desk research
  - In-depth interviews
  - Questionnaire survey
- Focus on both administration body (CzechInvest) and subsidy recipients (successfull ones)
  - 41 one subsidy recipients
- Inclusion of unsuccessful applicants through rate of successful applications

Operational Programme Enterprise and Innovation

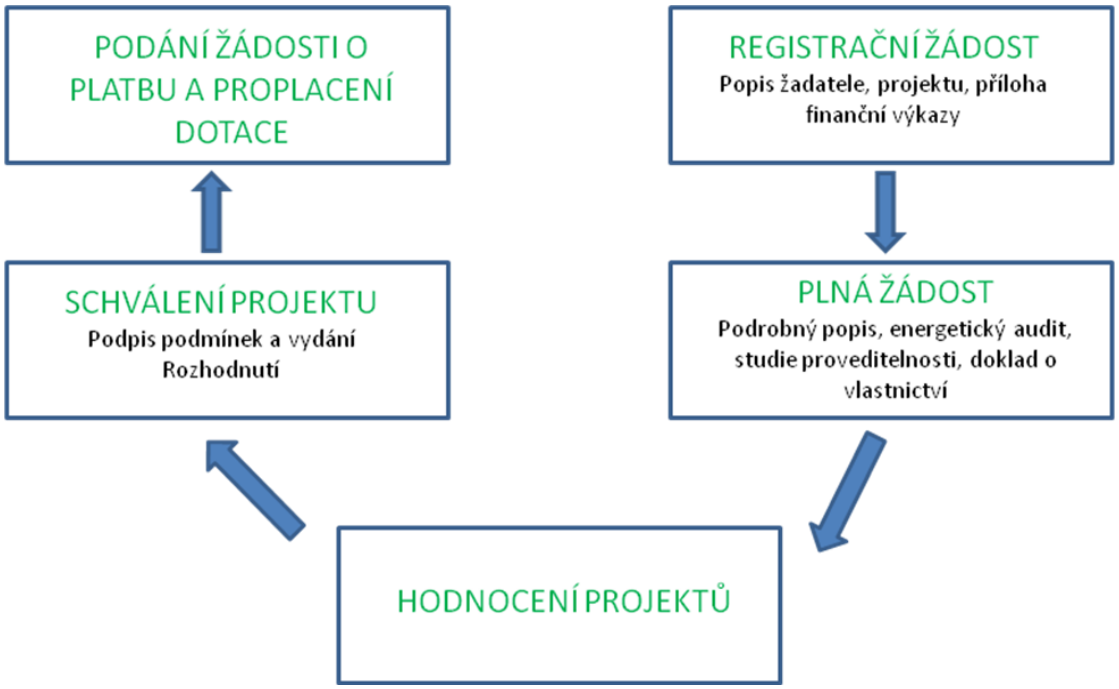
- Fourth largest OP in the Czech Republic
- In 2007 – 2013 3 041 million EUR available
  - 12 % of all OP in CZ
- Additional 500 million EUR from national resources
- Priority axis 3 – Effective energy
  - Energy savings and RES
  - Implemented through Eco-Energy Programme
  - ca 418 million EUR (12 % of total OPEI allocation)

OPE – Priority Axis 3

- Over 1000 projects so far
- Type of projects:
  - Energy efficiency measures in production, to lesser extent RES (biomass, biogas, heat pumps)
- Type of applicants
  - SMEs
- Average subsidy per project
  - 11 mil CZK (440 000 EUR)

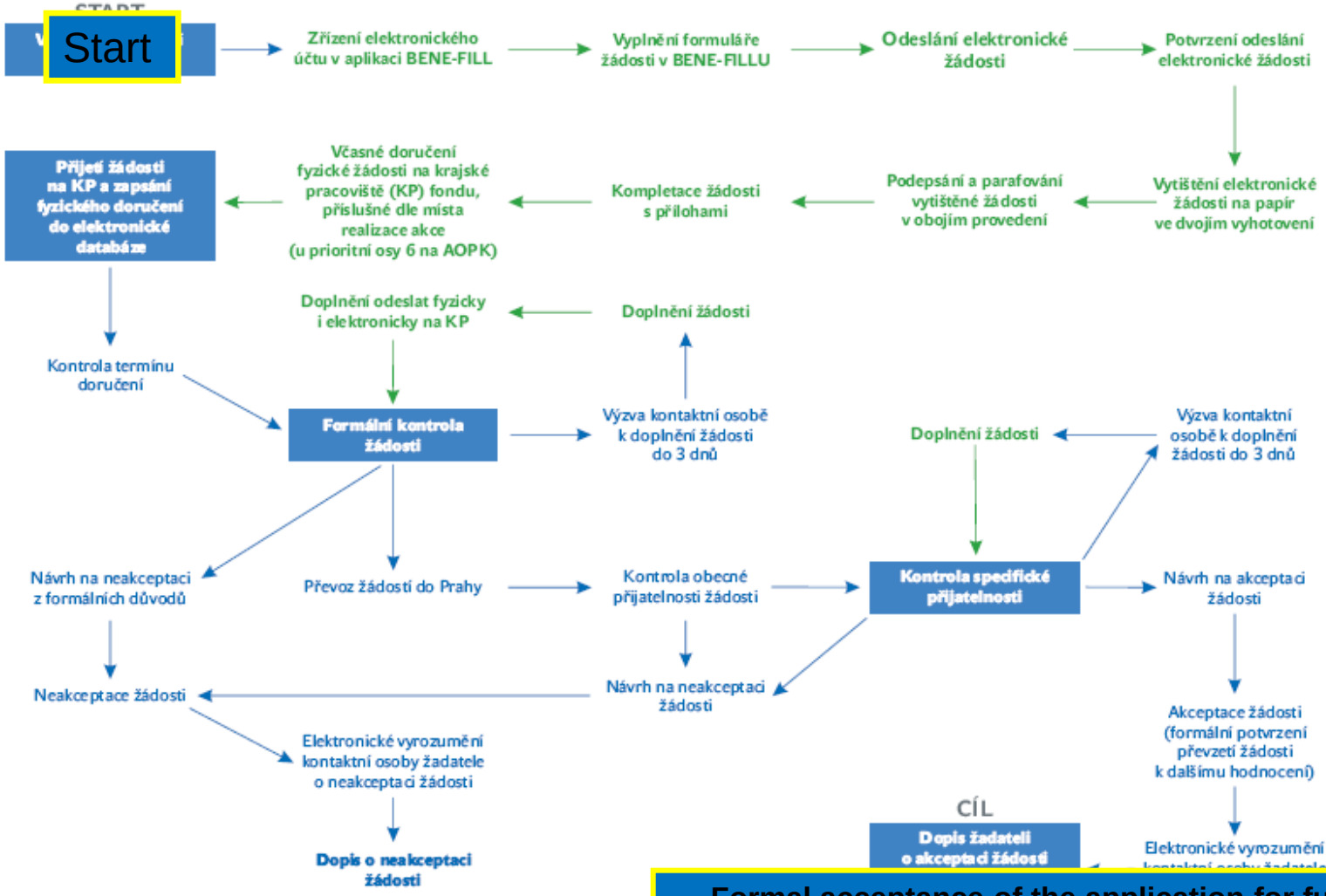
Indicator	Based on ex-ante evaluation of I. and II call	Target value (year 2015)
Installed capacity - RES (MW)	107	180
Energy savings (TJ/year)	3472	8 000
Electricity generation of RES (GWh/year)	674	1 100
Heat generation from RES (TJ/year)	924	1 200

Application process



Source: Růžička 2011

Application process – other programmes



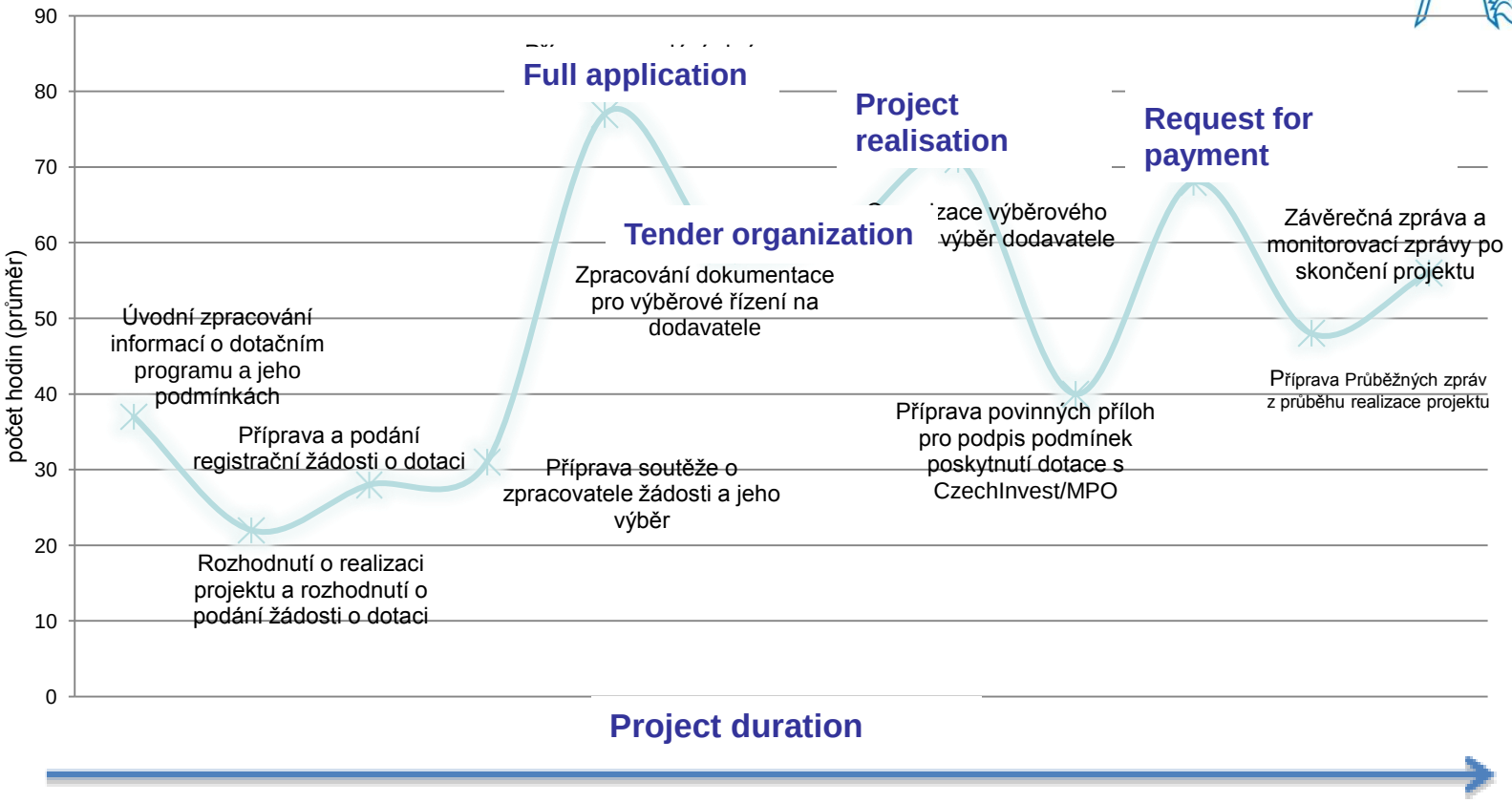
Formal acceptance of the application for further evaluation

Source: State Environmental Fund

Transaction costs – Applicant I. Structure

- Quite complex process
  - the application and implementation is often done with external consultant
  - Rate of sucessfull applications is 69 %
- Applications
  - 2 steps – registration and full application
  - Documents needed (always electronically)
    - Energy audit, feasibility study, financial realisation, building approval
- Implementation
  - Organization of tenders, request for payment
- M&V
  - Monitoring reports – 4 years

Transaction costs – Applicant II.

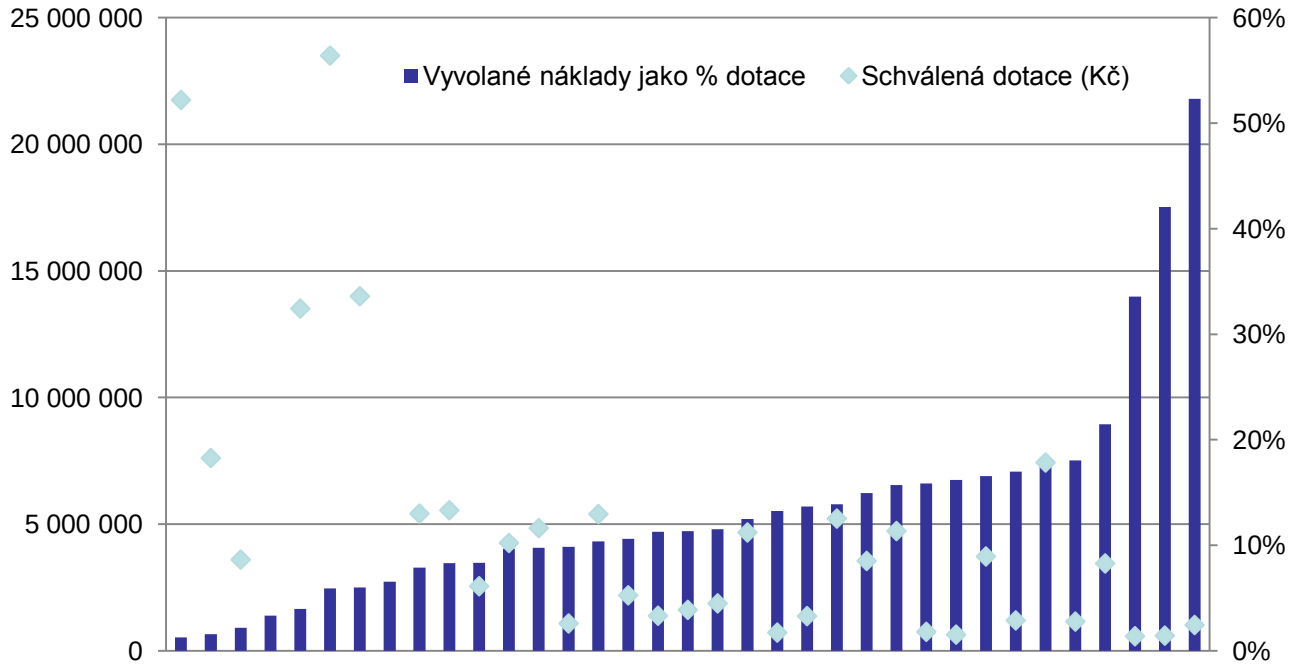


Time: Av. 504 hours. (130 - 1650 hours) – about 63 days of work
cca 115 000 CZK

External companies: 600 000 CZK (median 400 000 CZK)

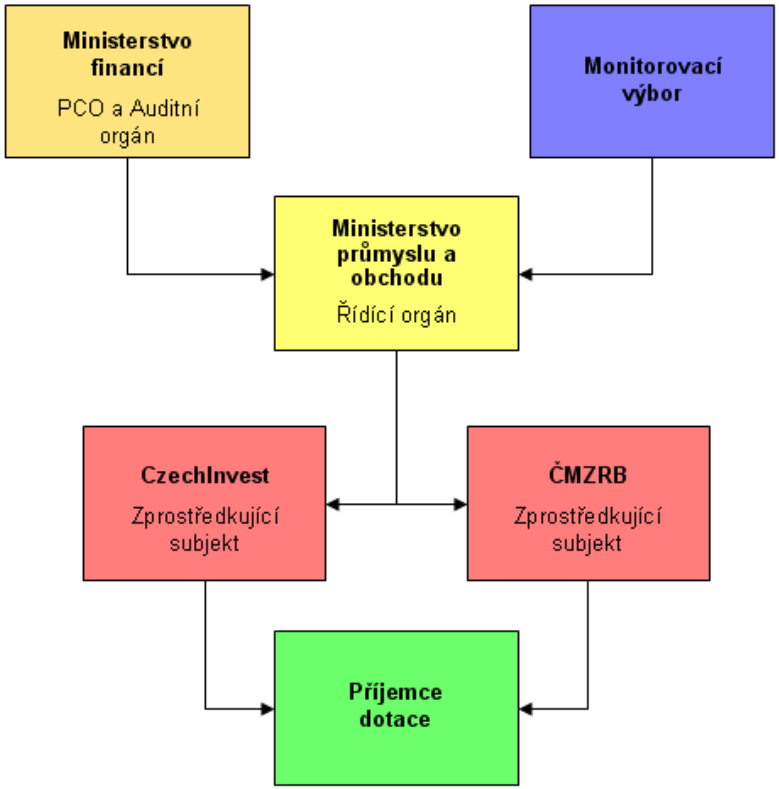
Transaction costs – Applicant III.

- In total, transaction costs of applicants in the case study represent **12 %** of subsidy allocation
  - **range of 1% - 52 % .**
- weak dependence between the level of subsidy and TCs (as %)



Transaction costs - administration

- Administrative costs of OPEI are covered by Priority Axis Technical Assistance
  - Representing 3,02 % of subsidy allocation
  - Furthermore, there are the Audit Body and payment certification authority
- Most demanding, similarly to applicants, are application evaluation and tenders
- System boundary set at the level of programme
  - need to include negotiations, too



Conclusions

- Evaluation of overall effectiveness of the programmes should include transaction costs
  - Otherwise we loose an important part of the story
- The evaluation should entail both structure (qualitative analysis) and level (quantitative analysis) of the transaction costs
- In total, transaction costs – additional 14 - 18 % of subsidy allocation (including unsuccessful applicants)
  - 100 EUR of subsidy = additional 14 - 18 EUR of TCs
  - The costs may be underestimated due to system boundary as it is set
- The burden is higher on the side of the recipients
  - Cant say that the burden is lower for bigger projects
- Need to compare with other energy efficiency instruments

Thank you for your attention.

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