Impact of biowaste collection on municipal solid waste management in Czechia

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Biowaste in general

- Biowaste – biodegradable municipal waste
- Up to 50% of the municipal waste in EU
  - Even more in developing countries (Bidlingmaier 2004)
- Separate biowaste collection can reduce this below 30% (Dahlén et al. 2007)
- Widely discussed issue in recent years
  - Strong stress towards reduction and separation
What to do with biowaste

- Best not to produce...

- Typically anaerobic digestion or composting
  - Composting less expensive, suitable for green waste (individual at source + centralized industrial)
  - AD more expensive, but can be used for energy conversion, etc., suitable for food leftovers

- No single optimal solution, case-dependent
Biowaste in Czechia

• Historically biowaste was not a problem

• Strong agricultural tradition, biowaste was not perceived as a waste, but as a resource

• Industrial biodegradable waste is not a problem, today are producers clearly identified and strongly incentivized

• Municipal biodegradable waste is an issue – law sets municipality as the producer and it has to cover the costs
  – Shifting roles of gardens to ornamental purposes
  – People do not utilize biowaste, resulting in excessive biowaste
Biowaste changes in Czechia

• People started to demand biowaste collection in recent years
  – But municipalities often reluctant (changing current system, expensive)

• Questions of how to collect it + how to treat it?
  – So far, main focus on green waste
  – Food leftovers still to take care of

• In 2015 legislation requirements for each municipality to provide separate biowaste collection (many adopted earlier)
  – Central bins, kerbside collection, civic amenity sites, home composters...
  – Biowaste mostly treated in composting plants (more suitable than AD)
Research purpose and data

• Main question was the impact of the introduction of separate biowaste collection on the municipal waste management of the municipalities
  – What was the effect on biowaste amount?
  – What was the effect on residual waste amount?
  – What was the effect on waste expenditures?

• Data from 2009-2012 (some data not available)
• Only municipalities that begun with biowaste included
Development of green municipal waste in Czechia

- Gradual increase since 2007, especially since 2014
- Per capita amount increased from 10 kg in 2002 to 50 kg in 2015
Interannual change in collected biowaste with the biowaste collection

- Reported increase in collected biowaste (green municipal waste):
  - 1/3 of municipalities less than 20 kg per capita
  - 1/3 of municipalities 20-40 kg per capita
  - 1/4 of municipalities 50+ kg per capita
Difference between collected biowaste per capita before and after the biowaste collection

- Half of the municipalities reported 100-1000% increase
Interannual difference in residual waste generation

- Half of the municipalities report up to 10% decrease of the residual waste
  - Some even 30-50% decrease of the residual waste (but other factors can be present)
- Average share of biowaste in residual waste + biowaste was 3.5% before and 17.2% after the introduction of separate collection (with several over 30%)
Change in the reported residual municipal waste after the introduction of biowaste collection

- Half of the municipalities reported up to 25 kg per capita decrease
  - Several municipalities had more than 50 kg per capita decrease
Change in municipal solid waste expenditure after the introduction of biowaste collection

- Half of the municipalities reported only ±10% change in waste expenditures
  - Almost half reported a decrease in total waste expenditures
Comments

• Presented results cover only initial year of biowaste collection
  – Usually at least 2-3 years until full potential, people need to adjust
  – Several municipalities reported additional 100-400% increase in collected biowaste in the second year
  – Strong effects in municipalities with no previous biowaste collection

• Positive effect also on residual waste amount
  – Sometimes possible to reduce frequency of waste collection

• Usually little effect on expenditures in the first year
  – Fixed contracts, pilot projects, savings are expected in later years
Conclusions

• After initial reluctance municipalities find separate collection of biowaste positive
  – Generally decrease of residual waste with little effect on costs
  – But experiences of individual municipalities vary greatly

• No single solution fits all
  – Unique characteristics of municipalities need to be taken into account, waste collection needs to reflect the specifics

• Proper information campaigns are crucial

• Issues of utilizing produced compost remains
• Thank you for your attention

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