Acceptability of Climate Change Policies
A review of the literature and preliminary results

Milan Ščasný, **Iva Zvěřinová**
Charles University Prague, Environment Center

Mikołaj Czajkowski
University of Warsaw

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Public acceptability and support: why?

Motivation:

- Resistance and reluctance to implement policies lacking public support
- Can be a factor inhibiting the successful implementation of climate policies (e.g. Steg et al. 2006), e.g., failure to introduce the carbon-energy taxation (France in 2010, etc.)

Aim:

- Detailed understanding of acceptability of climate change policies

CECILIA2050 objectives and approch

Objective – to analyze **factors influencing public acceptance:**

- Characteristics of policies and instruments (economics perspective)
- Psychological and individual factors (sociology, social psychology)

Approach:

- Systematic review of literature
- Secondary data analysis (Eurobarometer, ISSP)
- Empirical studies designed to investigate social preferences

Insights from the literature review

Climate policies more likely to be acceptable by people who …

- are aware of the climate changes
- feel more responsible for environmental problems
- feel a stronger moral obligation to contribute to the solution
- perceive the policies to be fair
  - distribution of costs / environmental benefits
  - preference for polluter-pays principle
- perceive the policies to be effective
  - temperature increase
  - % reduction of GHG emissions

Insights from the literature review: other factors influencing acceptance

- Environmental identity and **concern**, concern about climate change and energy security
- Perception of **effects of policies** on people's lives (threaten people's freedom of choice)
- Knowledge and providing **information** increase acceptability
- **Spatial distribution** of CO^2 reductions

- Mixed evidence on social-demographic factors:
- Income (positive), age (negative), education (positive)

(Fuiji et al., 2004; Kallbekken a Aasen, 2010)

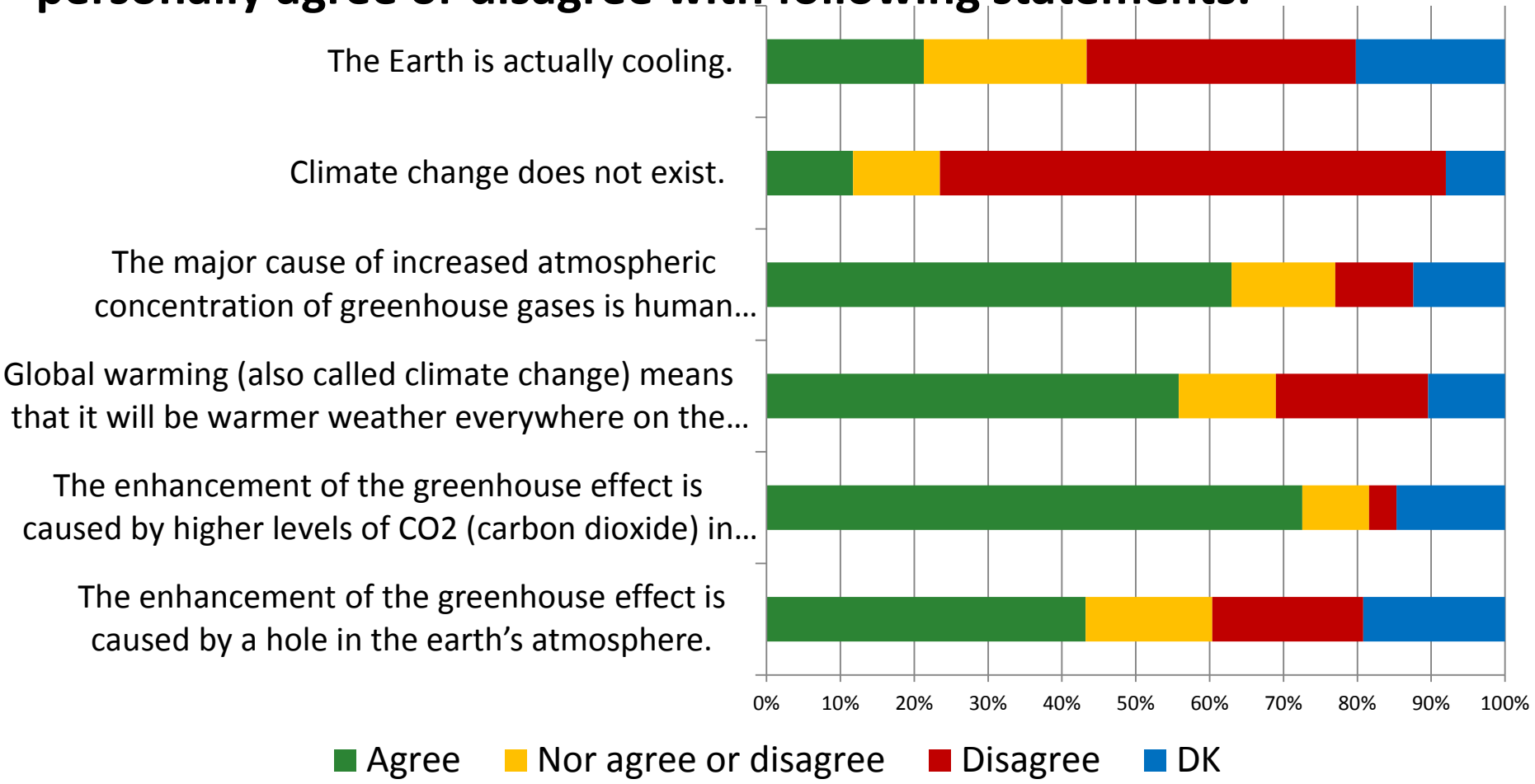
Insights from the literature review: tax-aversion

Support for Pigouvian taxes may be increased by:

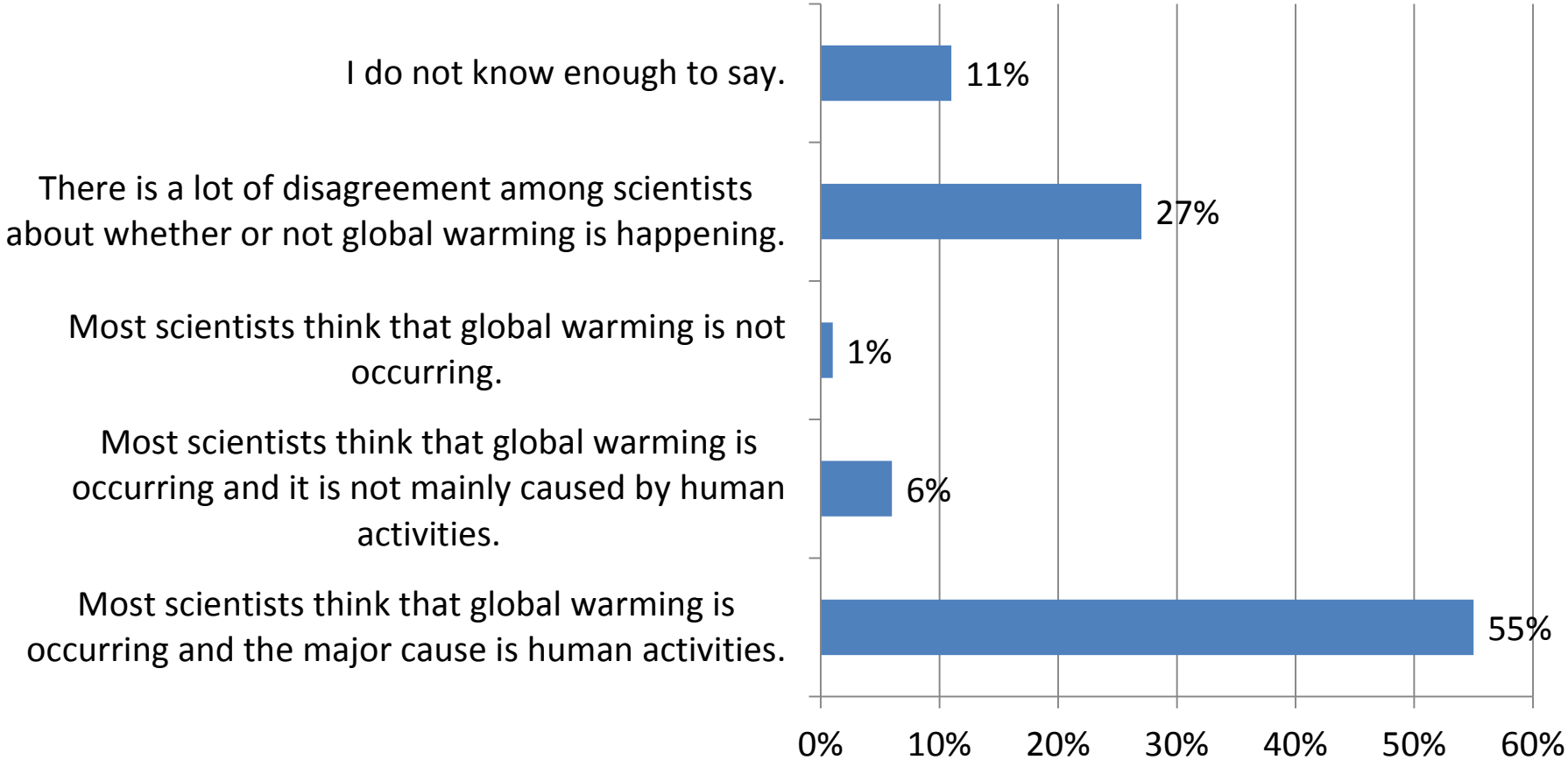
- **taking into account distributional consequences,** especially protecting from regressive effects
- **trust in government and public organizations** (transparency, public participation, etc.; see literature on public governance and public trust)
- **support acquiring information** about how the taxes work, how they can reduce the externalities and increase welfare and about their effectiveness
- **earmarking the revenues** for environmental measures, target narrowly specified groups
- public investments in **environmentally friendly technologies**, transport infrastructure, and renewable energy

Perception of climate change and its causes (%)

Q: Please indicate on the scale from -3 to 3 how much do you personally agree or disagree with following statements.

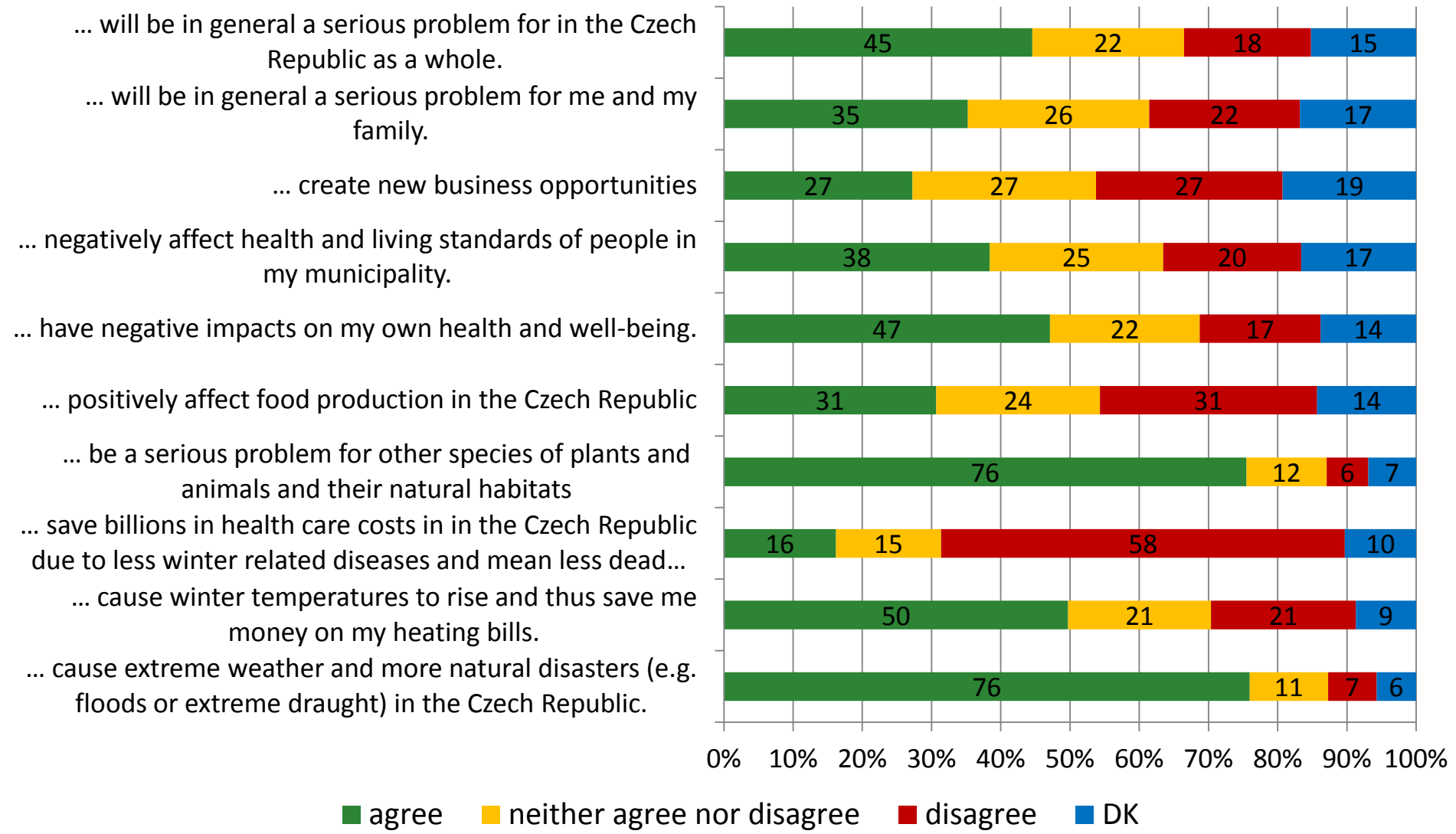


Public perception of disagreement among scientists about whether or not global warming is happening



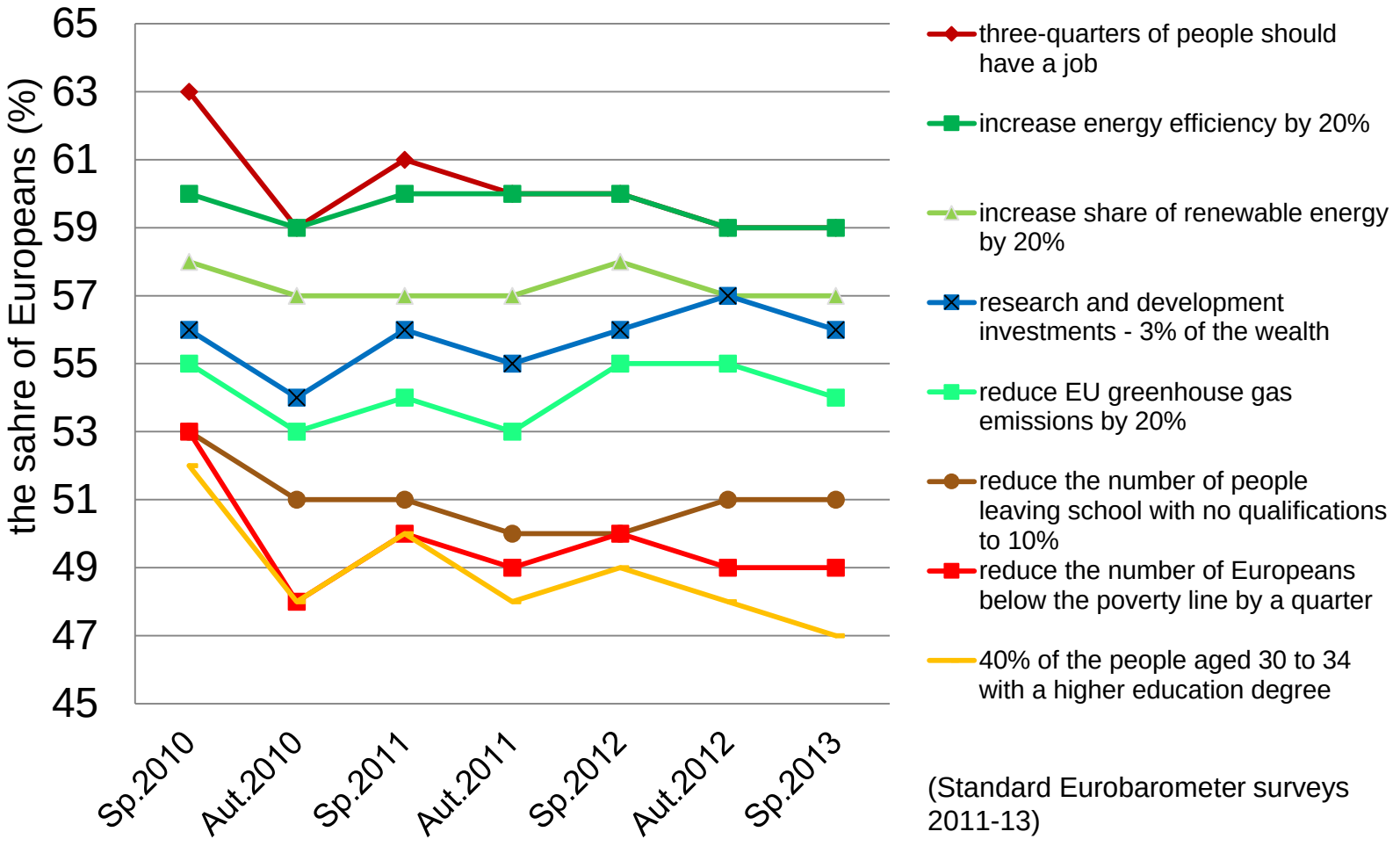
Source: Own 2014 survey (Czech respondents)

Public perception of climate change impacts (%)



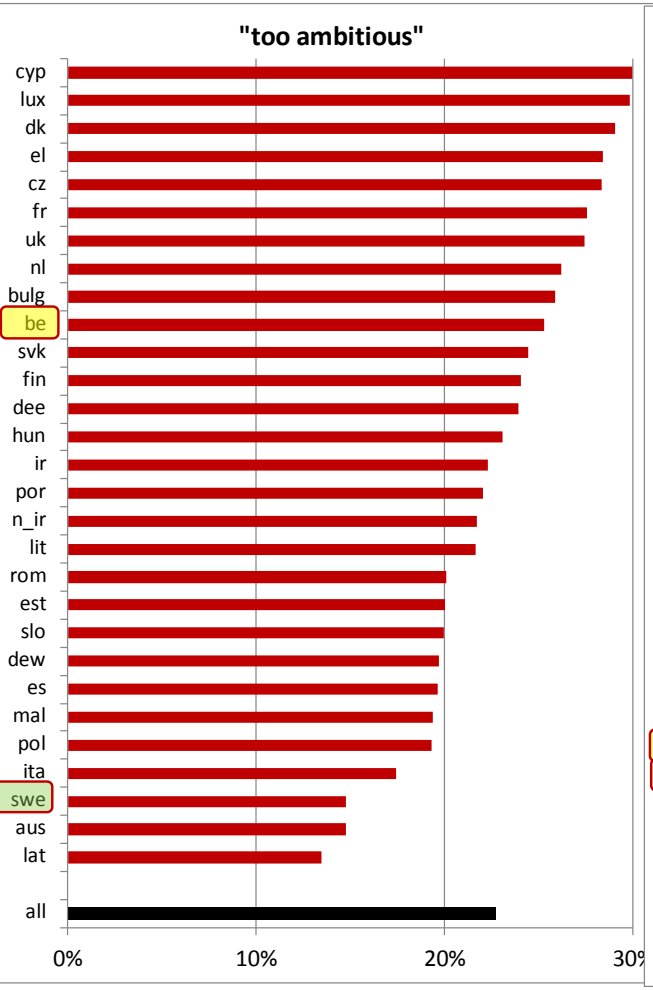
Source: own 2014 survey (Czech Rep)

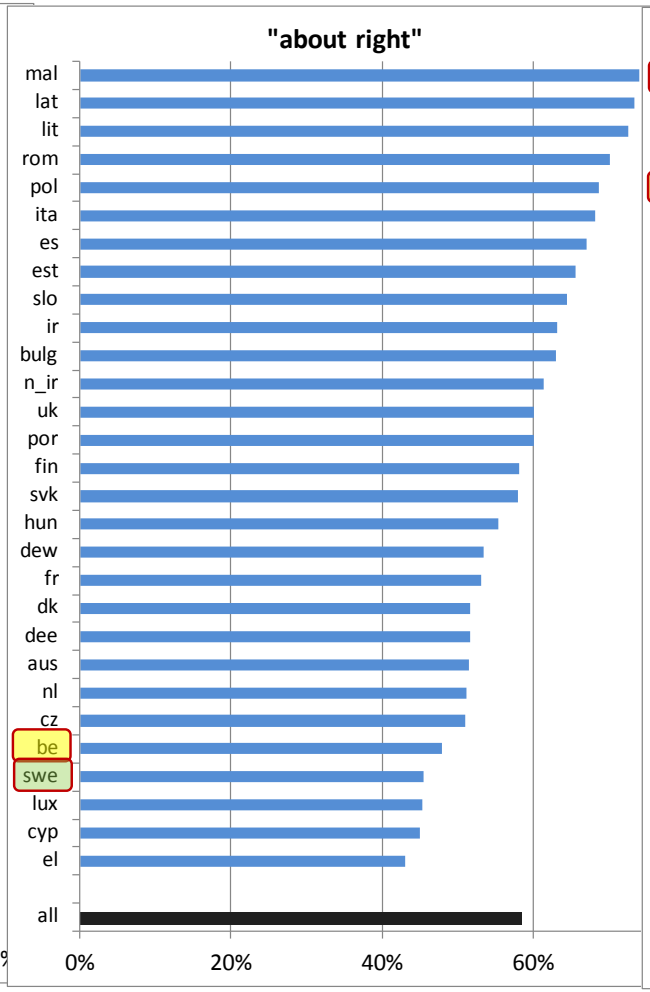
Perception of the 2020 targets: "about right"

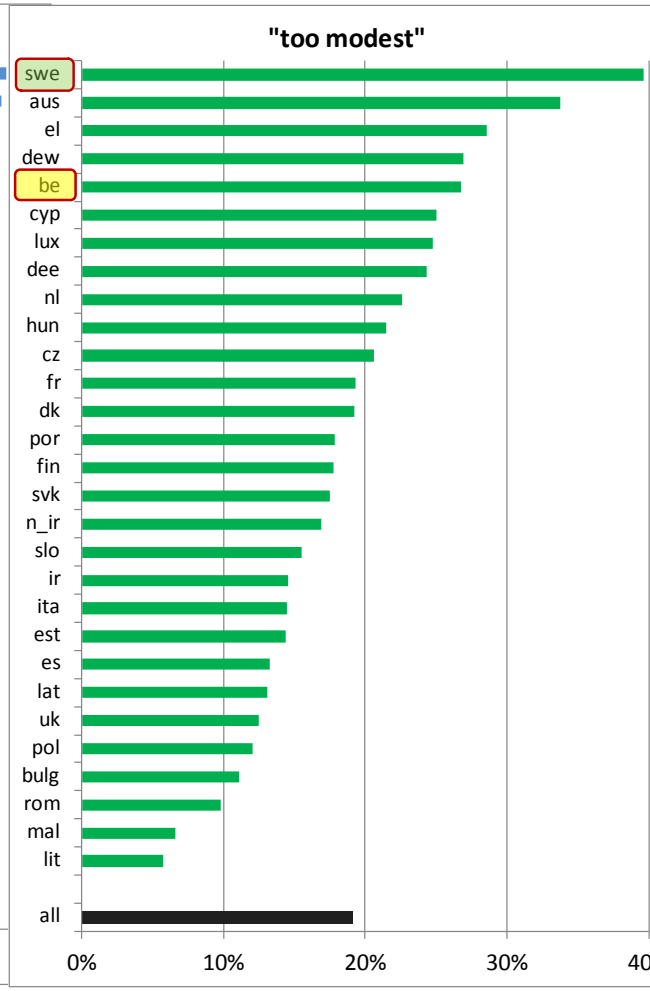


(Standard Eurobarometer surveys 2011-13)

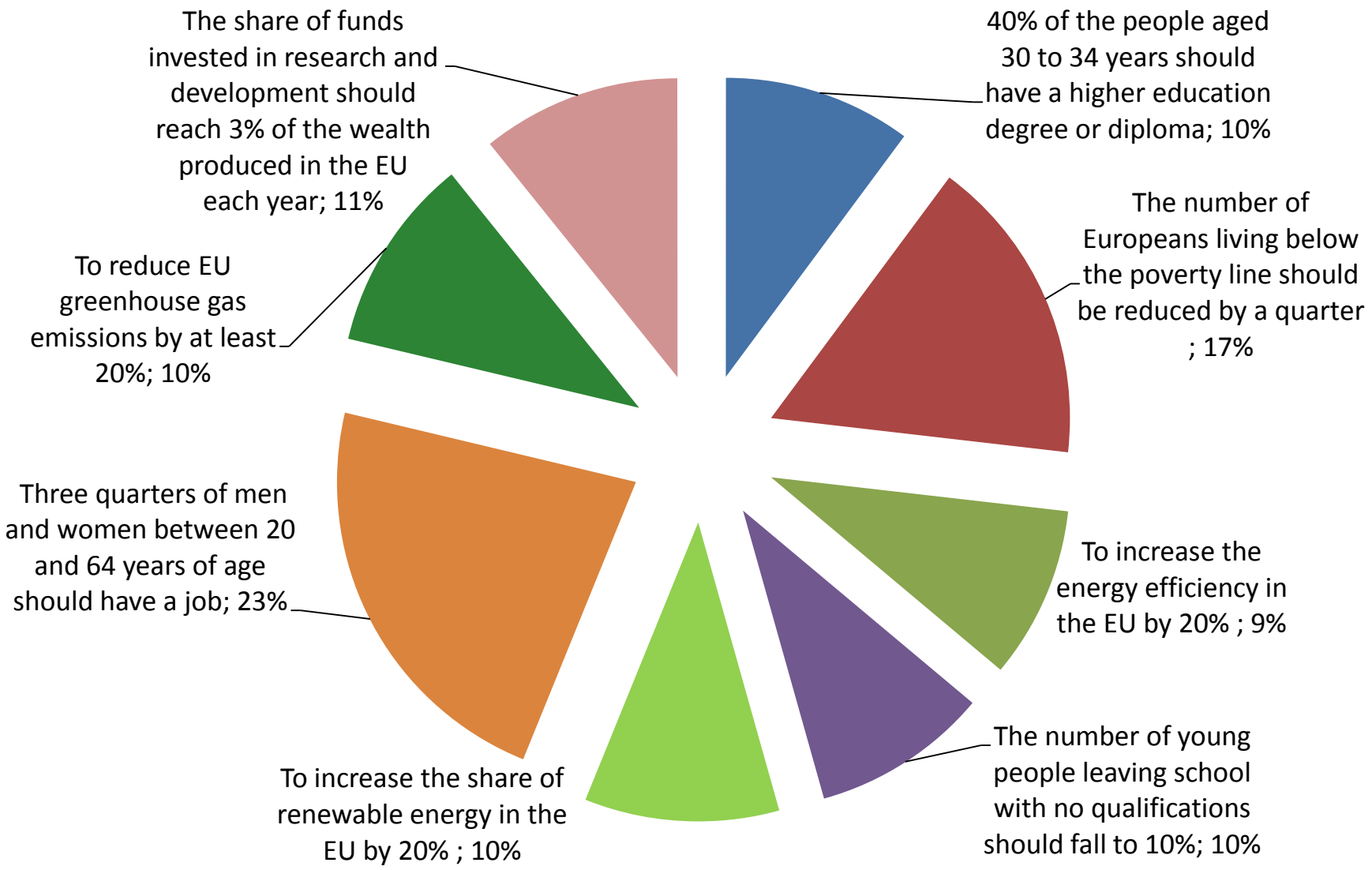
Perception of climate change policy targets (in %)







Allocation of the EU budget for the next year to reach the objectives by 2020 in the EU (average percentage)



Source: Own 2014 survey (Czech Rep)

Acceptability of climate mitigation policies

- Acceptability investigated by means of **the discrete choice experiments**
- Respondents presented with a choice of alternative (hypothetical) policies and asked to choose the one **they prefer the best**
- One of the alternatives represents the **status quo**, i.e. the current policy (no change)
- Policies described using **attributes** which represent their characteristics (e.g., approach, cost distribution, burden sharing, use of revenues)
- One of the policy attributes is **cost** (an increase in one's cost or expenditures)
- The choice typically framed as a referendum to ensure incentive compatibility

- Two discrete choice experiments on public acceptability of policies
  - #1 – how much and when to reduce emissions
  - #2 – how to reduce emissions

EXPERIMENT #1

Experiment no.2

Emission reduction targets

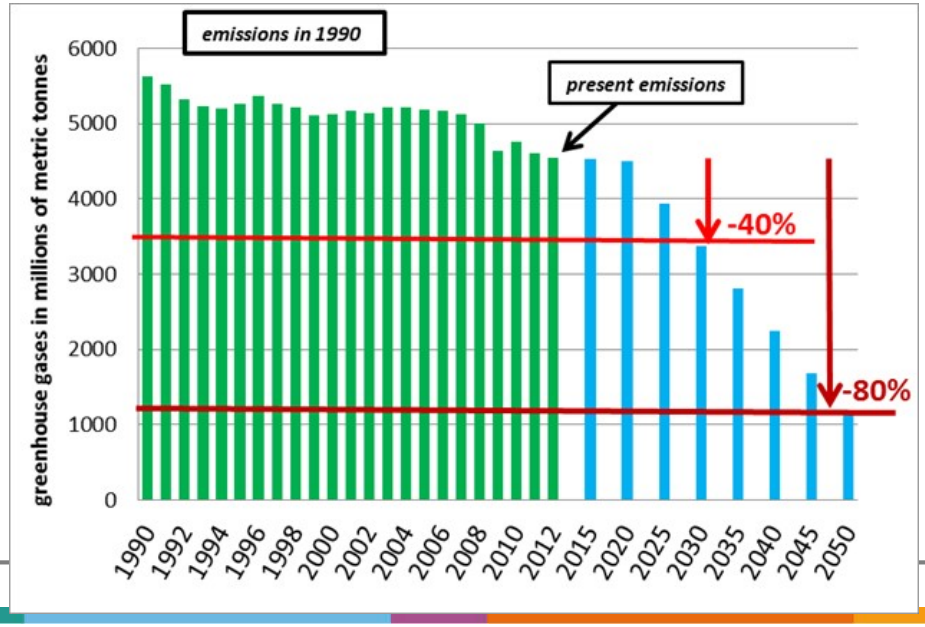
Key features

- Policies that may be introduced by the EU in order to mitigate climate change impacts
  - GHG **emission reduction targets** at the EU level
  - **Burden sharing** across the EU Member States
  - **Cost distribution** within countries
  - Monthly **cost to respondent's household**

Reduction targets

Information about the EU emission reduction targets

	20% reduction by 2020	40% reduction by 2030	80% reduction by 2050
GHG volume	emissions remain more-less as now, may slightly increase (**black dotted line**)	-20% by 2020 -40% by 2030 then, remain stable **(light red line)**	-20% by 2020 -40% by 2030 -80% by 2050 **(dark red line)**
Policy status	policy that has been agreed at the EU and is currently implemented	EU commitment, measures not implemented yet	EU commitment, measures not implemented yet



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Reduction targets

Information about the EU emission reduction targets

	20% reduction by 2020	40% reduction by 2030	80% reduction by 2050
Increase in the Earth's temperature by 2010 (every country does its share)	2.2ºC and 2.8ºC if the rest of the world adopts equivalent emission reduction targets	2ºC and 2.4ºC if the rest of the world adopts equivalent emission reduction targets	1.5ºC and 2.2ºC if the rest of the world adopts equivalent emission reduction targets
Likely impacts	- large drop in agricultural production - the loss of most coastal areas - substantial burdens to human health caused by disease, malnutrition, heat waves, floods and droughts - widespread extinction of animal and plant spices, a loss of their habitats	- moderate drop in agricultural production - loss of many coastal areas - some burdens and in a lower extent to human health caused by disease, malnutrition, heat waves, floods and droughts - extinction of some animal and plant spices and a loss of their habitats (especially coral reefs, arctic animals)	- the most severe impacts of climate change are prevented - some effects of global warming, however, they would not be as severe as in the lower reduction cases

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Reduction targets

Experimental design of discrete choice experiments

Attribute	Level
EU emission reduction target	• **-20%** by 2020 *(+2.2–2.8°C by 2100)* --- *[SQ]* • **-40%** by 2030 *(+2.0–2.4°C by 2100)* • **-80%** by 2050 *(+1.5–2.2°C by 2100)*
Burden sharing among the EU countries	• linear wrt wealth --- *[SQ]* • per capita • emission
Distribution of costs among citizens of the country	• lump-sum (fixed amount per person) • income (linear) --- *[SQ]* • income (progressive) • emission above a threshold
Monthly costs	• 0 --- *[SQ]* • 10 EUR, 25 EUR, 50 EUR, 75 EUR, 100 EUR

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Reduction targets
Choice card

	Option 1	Option 2	Current policy
EU emission reduction target	**40%** reduction by 2030 2ºC to 2.4ºC temperature rise by 2100	**80%** reduction by 2050 1.5ºC to 2.2ºC temperature rise by 2100	**20%** reduction by 2020 2.2 to 2.8°C temperature rise by 2100
Distribution of costs among the EU countries	the more inhabitants a country has, the more it pays	the more a country emits above the limit, the more it pays	the wealthier the country, the more it pays
Distribution of costs among citizens	every citizen pays the same costs	the more a citizen emits above the limit, the more pays	every citizen pays the same share of costs
Monthly costs	25 EUR	75 EUR	**0** EUR
Which option would you prefer?	☐	☐	☐

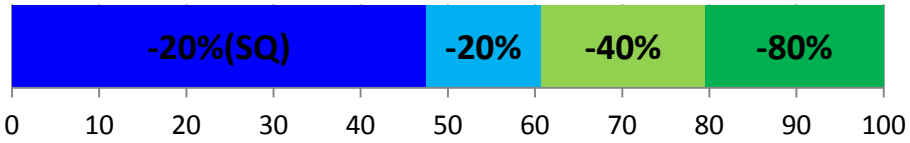
Experiment #2 – results

Emission reduction targets: Study in the Czech Republic (n=699)

- Would you be willing to spend anything at all for implementing any European Union greenhouse gas emissions reduction policy?

- What is the main reason you would not be willing to spend anything on such a program? (N=194, 27.8%)
  - I can't afford spending any more 42%
  - Costs should be paid by state 16%
  - CC would not be harmful 15%
  - Program will not be implemented 14%
  - Do not believe in climate change 3%
  - Program would not mitigate CC 3%
  - I don't have enough information 3%
  - I will not benefit from such a program 2%
  - I don't care 1%

- 6 choice questions on the GHG **emission reduction targets** at the EU *(n=4,812)*



(Own survey 2014– dataset II.)

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Estimation results, WTP-space (EUR)

Multinomial logit			
var.	coef.	st.err.	p-value
SQ	20.48***	6.2264	0.0010
Target -20%	Reference		
Target -40%	4.40	3.6697	0.2304
Target -80%	12.21***	3.5672	0.0006
BS – wealth	Reference		
BS – population	-3.61	3.6789	0.3265
BS – emissions	22.97***	3.8063	0.0000
DC – income (lin.)	Reference		
DC – lump sum	-6.09	4.3726	0.1633
DC – income (prog.)	7.75	4.8251	0.1078
DC – emissions	40.88***	5.0229	0.0000
Model characteristics			
LL0	-4408.97		
LL	-4116.61		
Pseudo R2	0.0663		
AIC/n	1.9730		
n	4182		
k	9		

Mixed logit						
	Means			Standard Deviations		
var.	coef.	st.err.	p-value	coef.	st.err.	p-value
SQ	6.36	5.6203	0.2574	90.48***	5.5933	0.0000
Target -20%	Reference					
Target -40%	11.36***	3.0210	0.0002	3.88	9.2546	0.6747
Target -80%	15.37***	2.9261	0.0000	23.39***	3.9835	0.0000
BS – wealth	Reference					
BS – population	-3.62	2.6545	0.1720	0.00	8.7511	1.0000
BS – emissions	16.44***	2.8486	0.0000	19.40***	4.3061	0.0000
DC – income (lin.)	Reference					
DC – lump sum	-6.03*	3.2939	0.0669	0.00	11.8371	1.0000
DC – income (prog.)	-4.23	4.1275	0.3045	24.94***	5.3741	0.0000
DC – emissions	31.42***	4.0309	0.0000	38.23***	4.5763	0.0000
Model characteristics						
LL0	-4408.97					
LL	-3433.57					
Pseudo R2	0.2212					
AIC/n	1.6507					
n	4182					
k	18					

Reduction targets

Contingent scenario: Debriefing (in %)

	Completely disagree						Completely agree	dk		agree 567
	1	2	3	4	5	6	7			
If the program was implemented it would bring **expected results** as described	5	4	11	20	23	17	5	15		**45**
It is likely that such a program will be **implemented**	5	9	15	20	18	9	3	20		**30**
It is likely that the European Union will **enforce** the program, if implemented	4	5	9	17	23	20	11	12		**54**
Each European Union country will fulfill its emission reduction requirements	12	12	17	20	13	9	4	12		**26**
Other countries in the world will adequately reduce their emissions	18	17	15	18	11	7	3	12		**21**
	Very unlikely						**Very likely**	**dk**		
How **likely** do you think it is **for the other countries** in the world to reduce their share of emissions?	14	22	20	17	11	3	2	11		**16**

EXPERIMENT #2

Instruments

Experimental design

Attribute	Level
Approach of the policy	• **taxes (charges)** on energy and emission • **incentives** on energy efficiency • removal of **environmentally adverse subsidies** • tradable emission **permits** • bans, **command-and-control**
Revenue recycling	• **environmental** programs • **public services (health, education)** • reduction **public debt** • mitigating **social problems** • **R&D** support
Distribution of costs among citizens of the country	• lump-sum (same amount) • income (linear) • income (progressive) • emission above a threshold
Increase in your monthly costs until 2050	• 0 --- *[SQ]* • 10 EUR, 25 EUR, 50 EUR, 75 EUR, 100 EUR

Status quo = current measures (emission targets will not be fulfilled after 2020) but cost nothing; revenue recycling and cost distribution not further specified

Experiment no. 3

Instruments to reach 80% emission reduction by 2050

	Policy A (new target after 2020)	Policy B (new target after 2020)	Current policy (no new targets after 2020)
Approach used by the policy	Taxes on energy and emission	Subsidies or support for energy savings	Currently implemented measures
Distribution of costs among the citizens	every citizen pays the same costs	the more the citizen emits above the limit, the more she pays	
Use of revenues in the country	environmental programs	public services (health, education)	
Increase in your household's monthly expenditures	**25 EUR**	**75 EUR**	**0 EUR**
Which option would you prefer?	☐	☐	☐

Estimation results, WTP-space (EUR)

Multinomial logit					Mixed logit						
						Means			Standard Deviations		
var.	coef.	st.err.	p-value		var.	coef.	st.err.	p-value	coef.	st.err.	p-value
SQ	-19.82***	4.0072	0.0000		SQ	-46.85***	5.8847	0.0000	134.77***	9.1972	0.0000
Incentives for en. ef.	Reference				Incentives for en. ef.	Reference					
Taxes / charges	-9.16**	3.6022	0.0110		Taxes / charges	-4.77	3.1992	0.1358	0.00	8.4273	1.0000
Rem. perv. subs.	1.66	3.4799	0.6328		Rem. perv. subs.	1.31	3.3860	0.6985	23.78***	4.9518	0.0000
Tradable permits	-9.94***	3.4470	0.0039		Tradable permits	-8.46***	3.1664	0.0075	3.81	7.0480	0.5884
Bans	-6.14*	3.4379	0.0739		Bans	-3.65	3.3793	0.2801	21.56***	5.3106	0.0000
DC – income (linear)	Reference				DC – income (linear)	Reference					
DC – lump sum	-0.08	3.1973	0.9798		DC – lump sum	-2.31	2.8613	0.4186	0.00	8.5390	1.0000
DC – income (prog.)	6.95**	3.0807	0.0239		DC – income (prog.)	3.94	3.0236	0.1919	22.86***	4.1034	0.0000
DC – emissions	28.35***	3.0470	0.0000		DC – emissions	27.05***	3.0731	0.0000	24.65***	4.1786	0.0000
RR – environment	Reference				RR – environment	Reference					
RR – public services	7.60*	3.5316	0.0314		RR – public services	7.78**	3.5267	0.0272	27.55***	4.5903	0.0000
RR – social issues	2.47	3.4979	0.4791		RR – social issues	2.02	3.3566	0.5457	22.50***	5.0448	0.0000
RR – technology	-3.58	3.5637	0.3151		RR – technology	-3.90	3.4624	0.2593	24.40***	4.1872	0.0000
RR – debt	2.95	3.4649	0.3934		RR – debt	0.43	3.3405	0.8966	29.17***	3.9375	0.0000
Model characteristics					Model characteristics						
LL0	-4582.19				LL0	-4582.19					
LL	-4158.54				LL	-3133.82					
Pseudo R2	0.0925				Pseudo R2	0.3161					
AIC/n	1.9950				AIC/n	1.5112					
n	4182				n	4182					
k	13				k	26					

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ONGOING WORK...

Revised instrument

Large samples collected in the Czech Republic, Poland, UK

Analysis of socio-demographic drivers of preference heerogeneity

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Preliminary conclusions

- Respondents prefer policies that promote **renewables** over policies that target **energy efficiency**
- **Incentive-based policies** are preferred, followed by **removal of environmentally harmful subsidies**, policies that impose **pricing** least support**.**
  - In line with other studies (Kallbekken et al. 2011; Shogren 2012), Czechs seem to be allergic to the *"t-word"*; re-framing the tax as a "charge" increased support
- Revenue recycling matters — Czechs prefer using the additional revenues for **public services** (health, education) and **to mitigate social problems**, while they support **R&D support** the least; support of **environmental programs** stands somewhere in the middle out of the five RR options.
- Burden sharing based on **an excess of GHG emissions** is accepted the most, **per capita sharing** is the least accepted.
- Cost distribution should be linked to **emissions**, the lump-sum (per capita) cost payment is the least accepted.

Preliminary conclusions

- Implicit price (conditional!) of the GHG emission targets are **11 EUR for -40%**, and **15 EUR for -80%** (per household per month)
  - Depends on policy characteristics
  - Very large preference heterogeneity
- However, large share of respondents with 0 WTP
  - Only 30% of respondents agree it is likely that such a policy will be implemented
  - Substantial scepticism for ‘others doing their share’
  - Questionable effects for the climate change

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Thank you for your attention

Milan Ščasný, milan.Scasny@czp.cuni.cz

Iva Zvěřinová, iva.zverinova@czp.cuni.cz

Mikołaj Czajkowski, miq@wne.uw.edu.pl