

Towards a new wave of electrification

Hans Holzacker, Chief Economist CAREC Institute



Knowledge for Prosperity

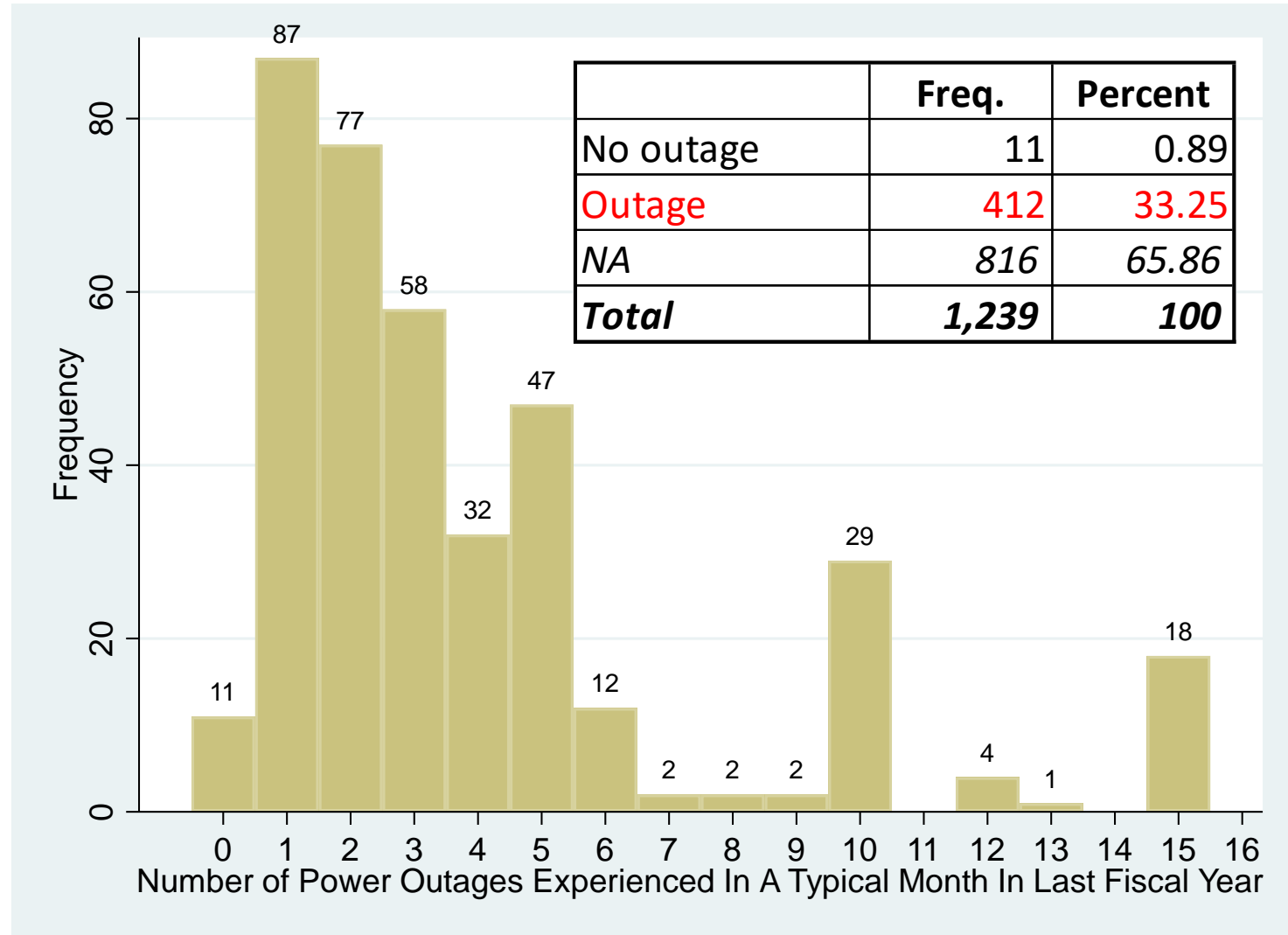
Outline



Three topics,
14 slides

- ***I. The need for (green) electrification***
- ***II. The Fergana Valley project***
- ***III. Future research / joining forces?***

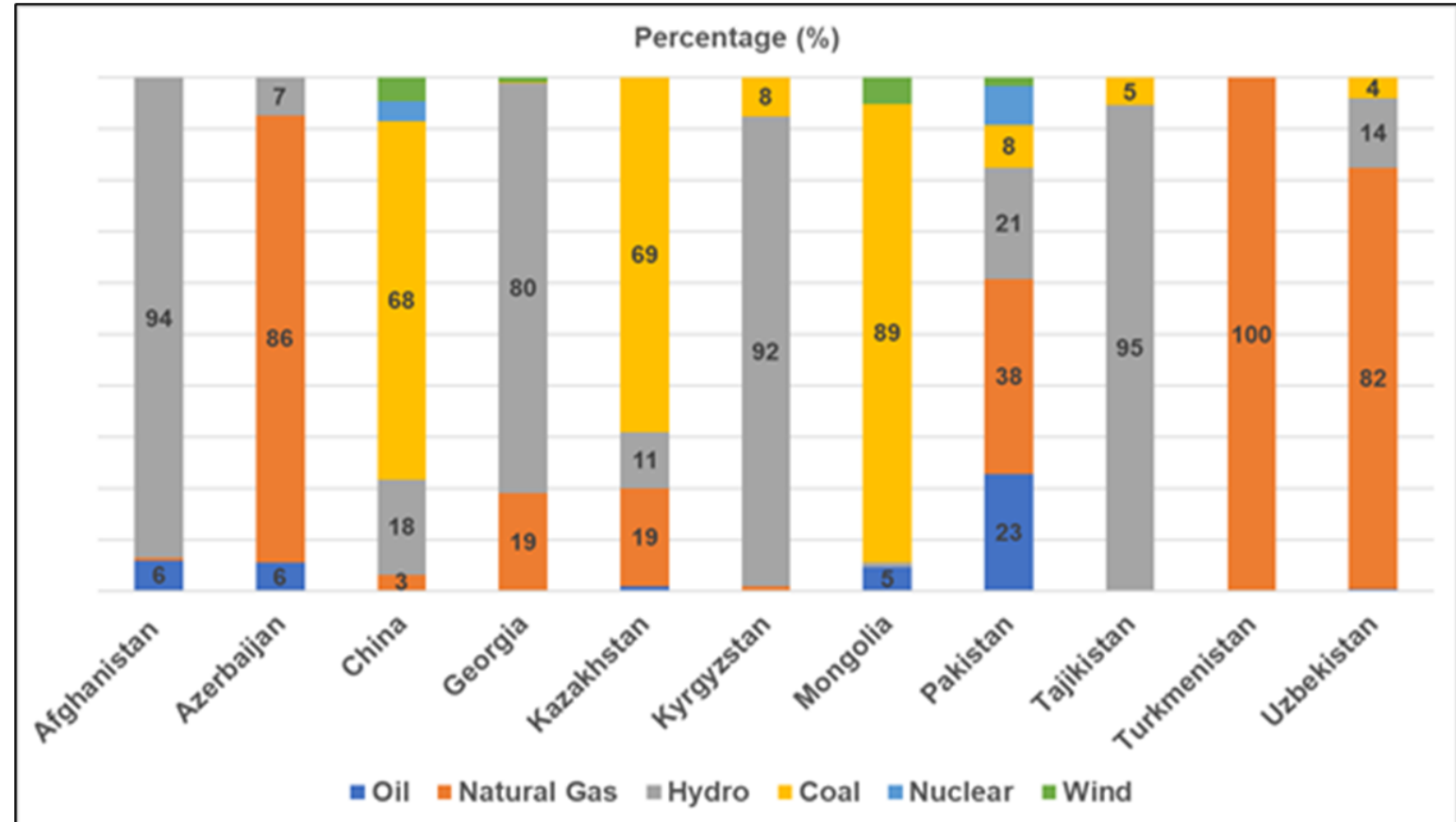
The need:
 About one-third of businesses reported power outages in the World Bank's 2019 enterprise survey for Uzbekistan.



Source: <https://www.enterprisesurveys.org/en/enterprisesurveys>

The need:
 In most CAREC economies electricity generation relies heavily on fossil fuels.

Sources of electricity/energy



Source: CAREC Institute, 'Climate Vulnerability, Infrastructure, Finance and Governance in CAREC Region.' Research report, 2020, compiled from 2019 IEA data

Realizable technical potential for RE deployment (MW)

Country	Kazakh- stan	Kyrgyz- stan	Tajiki- stan	Turkmeni- stan	Uzbeki- stan
Small hydro	4,800	1,800	23,000	1,300	1,800
Wind	354,000	1,500	2,000	10,000	1,600
Solar PV	3,760,000	267,000	195,000	655,000	593,000
Biomass	300	200	300	not significant	800

Source: Compiled from UNDP Renewable Energy Snapshots for respective Central Asian countries. Retrieved from

https://www.eurasia.undp.org/content/rbec/en/home/library/environment_energy/renewable-energy-snapshots.html

What about geothermal energy?

Uzbekistan (Mtoe)	Theoretical potential	Technical potential
Geothermal energy	67,000	0.3

Source: <https://review.uz/post/vozobnovlyamaya-energiya-dlya-ustoychivogo-razvitiya>

The potential

The area....
(including for cooperation...)



Knowledge for Prosperity

Source: https://www.energycharter.org/fileadmin/DocumentsMedia/News/4_CDC_Energiya.pdf

The Fergana Valley household energy access project:

The sampling in the three Fergana Valley countries

Table 1.2: Research sample in Kyrgyz Republic

Region	Total population				Sample population			
	Total population 18 years and older	Urban population	Rural population	Urban population, %	Rural population, %	Total number of respondents	Urban population	Rural population
Batken	428,636	103,810	324,826	3.71	11.60	80	20	60
Osh	1,104,248	87,824	1,016,424	3.14	36.29	202	20	182
Gorkenesh Osh	258,111	232,816	25,295	8.31	0.90	55	45	10
Jalal-Abad	1,009,889	228,301	781,588	8.15	27.91	185	45	140
Total	2,800,884	652,751	2,148,133,0	23.31	76.69	522	130	392

Source: National Statistical Committee of the Kyrgyz Republic, 2021

Table 1.3: Research sample in Tajikistan

Region	Total population				Sample population			
	Total population 18 years and older	Urban population	Rural population	Urban population, %	Rural population, %	Total number of respondents	Urban population	Rural population
Sogdian	1,620,300	443,962	1,176,338	27.4	72.6	500	137	363

Source: Agency on Statistics under the President of the Republic of Tajikistan, 2022

Table 1.4: Research sample in Uzbekistan

Region	Total population					Sample population		
	Total population 18 years and older	Urban population	Rural population	Urban population, %	Rural population, %	Total number of respondents	Urban population	Rural population
Andijan	3,322,722	1,734,479	1,588,243	52.2	47.8	160	80	80
Namangan	2,997,543	1,943,913	1,053,630	64.9	35.1	150	100	50
Fergana	3,976,265	2,264,136	1,712,129	56.9	43.1	190	110	80
Total	10,296,530	5,942,528	4,354,002	57.7	42.3	500	290	210

Source: Agency of statistics under the President of the Republic of Uzbekistan, 2022

The Fergana Valley household energy access project:

There are issues with electricity access in the Valley.

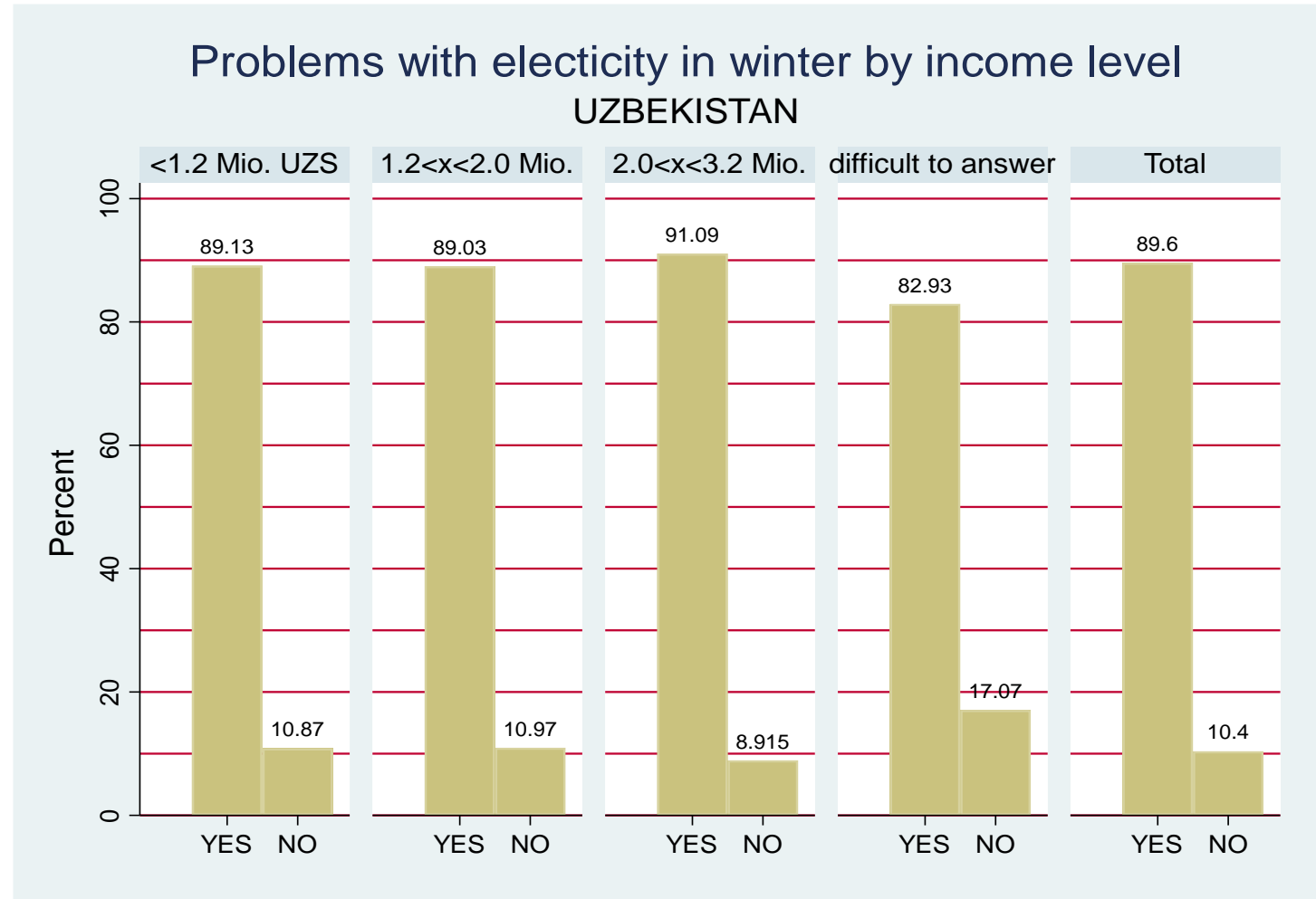
What type of energy supply does your household experience problems with in winter?

Answer options	Kyrgyz Republic		Tajikistan		Uzbekistan	
	N	%	N	%	N	%
With hot water supply/hot water	88	16.9	224	44.8	53	10.6
With electricity	238	45.6	337	67.4	448	89.6
With gas	38	7.3	42	8.4	253	50.6
With central heating	5	1.0	-	-	9	1.8
No problems	204	39.1	113	22.6		-
Coal is expensive	25	4.8	-	-	-	-
The heating system is not working well	5	1.0	-	-	-	-
Shortage of biofuels	1	0.2	-	-	-	-
Difficult to answer	-	-	2	0.4		-

Source: CI-ADBI-PORI Fergana Valley household energy access survey (unpublished)

The Fergana Valley household energy access project:

Issues with electricity vary only slightly even by income levels



Source: Author's calculation based on the CI-ADB-IPORI Fergana Valley household energy access survey (unpublished)

The Fergana Valley household energy access project:

Lots of coal in the Kyrgyz Republic and Uzbekistan; electricity in Tajikistan.

If you have an autonomous heating system, what energy source do you use to heat your house during the winter season?

Answer options	Kyrgyz Republic		Tajikistan		Uzbekistan	
	N=466		N=500		N=500	
	N	%	N	%	N	%
Coal	413	88.6	68	13.6	273	54.6
Fuel oil/diesel	-	-	2	0.4	3	0.6
Natural gas from underground pipes	2	0.4	-	-	76	15.2
Propane (gas in cylinders)	-	-	03	0.6	43	8.6
Electricity	31	6.7	351	70.2	65	13.0
Biofuels (dung)	5	1.1	10	2.0	1	0.2
Kerosene	-	-	-	-	-	-
Firewood	15	3.2	64	12.8	39	7.8
Solar panels	-	-	-	-	-	-
Waste and garbage (rubber, plastic, paper, etc.)	-	-	2	0.4	-	-
<i>Total</i>	466	100.0	500	100.0	500	100.0

Source: CI-ADBI-PORI Fergana Valley household energy access survey (unpublished)

The Fergana Valley household energy access project:

In Tajikistan, with heating predominantly by electricity, there are relatively frequent heating issues.

Did you have any interruptions in supply, difficulties with heating last winter?

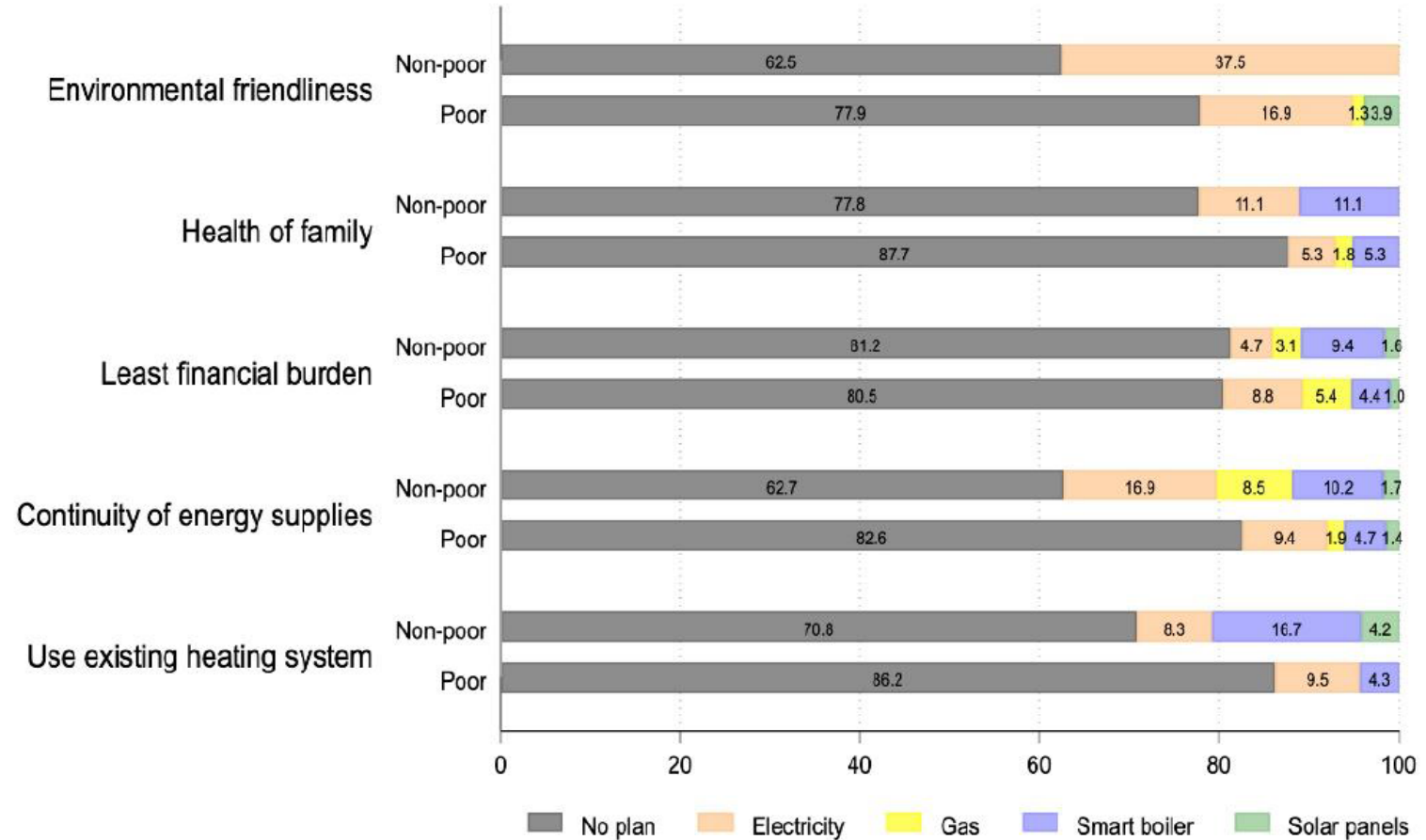
Answer options	Kyrgyz Republic		Tajikistan		Uzbekistan	
	N=466		N=500		N=500	
	N	%	N	%	N	%
Yes, several times a week	12	2.6	132	26.4	294	58.8
Yes, a few days a month	14	3.0	88	17.6	147	29.4
Yes, a few days a quarter	65	14.0	71	14.2	47	9.4
Yes, a few days a year	28	6.0	39	7.8	-	-
No, I didn't	311	66.7	154	30.8	11	2.2
Difficult to answer	36	7.7	16	3.2	1	0.2
<i>Total</i>	466	100.0	500	100.0	500	100.0

Source: CI-ADBI-PORI Fergana Valley household energy access survey (unpublished)

However, there might be even more demand for electricity in the region in future including for heating...

or perhaps not thanks to higher energy efficiency?

Plans to switch from dirty to clean heating



Source: ADBI calculations based on the CI-ADBI-PORI Fergana Valley household energy access survey (unpublished)

The CAREC Institute's intentions for energy research...

Joining forces?

- ***I. The Fergana Valley project - Phase 2***
- ***II. Renewable Energy Investment Ecosystem in Central Asia***
- ***III. Businesses' Innovation Plans for energy efficiency and for digitalization***
- ***IV. Options for financing of green energy projects – an overview (commercial bank facilities, taxonomies etc.)***

**Looking forward to
a fruitful exchange of views also
in future and perhaps some
cooperation!**

<https://www.carecinstitute.org/>

hans.holz hacker@carecinstitute.org