

A map of Central Asia and surrounding regions. The map shows Russia to the north, China to the east, and Iran, Afghanistan, and Pakistan to the south. The five Central Asian countries are highlighted in different colors: Kazakhstan (light green), Uzbekistan (yellow), Turkmenistan (light brown), Kyrgyzstan (pink), and Afghanistan (purple). Major cities like Astana, Tashkent, Bishkek, and Ashgabat are marked. The Caspian Sea is visible to the west. The title text is overlaid on the map.

First Steps towards Energy Transition in Central Asia: Opportunities for German and EU Engagement

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Research Questions

- What are the prospects for renewable energy (RE) and energy efficiency (EE) in Central Asia?
- How Germany and EU can foster energy transition in Central Asia?

Methodology









- Review of literature and existing projects on RE and EE in Central Asia
- Interviews with German and Central Asian experts, incl.
 - government representatives
 - implementation agencies
 - international organizations
 - NGOs

High Prospects for Renewable Energy Generation

- In Kazakhstan, the potential of wind energy alone exceeds 10 times the country's projected electricity needs by 2030
 - Tajikistan in the list of the world's top 10 countries with the highest hydropower potential
 - Solar and biogas energy in Uzbekistan
 - Energy of small rivers in Kyrgyzstan
 - Solar energy in Turkmenistan
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- Solar water heating and off-grid power generation from RE make a strong case in the distant rural areas of Central Asia

RE Deployment in Central Asia

Huge Gap between Technical and Installed Capacity

	Kazakhstan	Uzbekistan	Kyrgyzstan	Tajikistan	Turkmenistan
Share of RE in electricity generation, 2012	0.6%	3 %	1 %	2.5%	0,2%
 Installed capacity, MW	<1	<1	0	<1	0
 Technical potential, MW	3,760,000	593,000	267,000	195,000	655,000
 Installed capacity, MW	2	< 1	0	0	0
 Technical potential, MW	354,000	1,600	1,500	2,000	10,000
 Installed capacity, MW	115	394	41.4	132	5
 Technical potential, MW	4,800	1,800	1,800	23,000	1,300
 Installed capacity, MW	0	1.5	0	0	0
 Technical potential, MW	300	800	200	300	Not significant

Positive RE/EE Developments in Central Asia

- All CA countries with the exception of TM adopted primary legislation on RE and formally introduced financial incentives (grid access, feed-in tariffs)
- Kazakhstan: leader on RE/EE in the region
 - National plan on transition to green economy
 - Voluntary pledges on reduction of GHG emissions
 - Pilot emission trading system
 - World Expo 2017 „Future Energy“ in Astana
- Uzbekistan: 1st PV power park in the region (with ADB loans)
- Kyrgyzstan: EBRD/EU Loan Scheme on Energy Efficiency
- Interest esp. to EE initiatives is growing:
 - KZ, UZ, TM see it as way to increase their fossil fuel exports
 - TJ and KG hope to reduce their dependence on energy imports

Barriers to RE Deployment in Central Asia

- High fossil fuel subsidies and low electricity prices make RE uncompetitive
- Limited or no access to affordable bank loans
- High initial investment costs and risk of return of investment
- Limited number of local RE technology providers and specialists
- Lack of feasibility studies on RE perspectives
- Little public discussion of RE benefits
- Scepticism of political and business elites towards RE

Recommendations for German/EU Cooperation with Central Asia on RE and EE

- **Communication of RE/EE success stories (e.g. Energiewende)**
 - Targeted information on RE in Russian/field trips and conferences
- **Know-how and technology transfer**
 - Legal frameworks and financial mechanisms
- **Development cooperation**
 - Extend support to RE and EE projects
- **New Framework Central Asia Strategy**
 - Focus on RE and EE

Conclusions

- Latest developments in the RE/EE sector in Central Asia are promising
- Political, institutional and economic barriers hinder investments in RE/EE projects in the region
- With the relevant technical and financial support Central Asian countries could realize their vast RE potential and accelerate their currently slow pace of transition to low-carbon economies