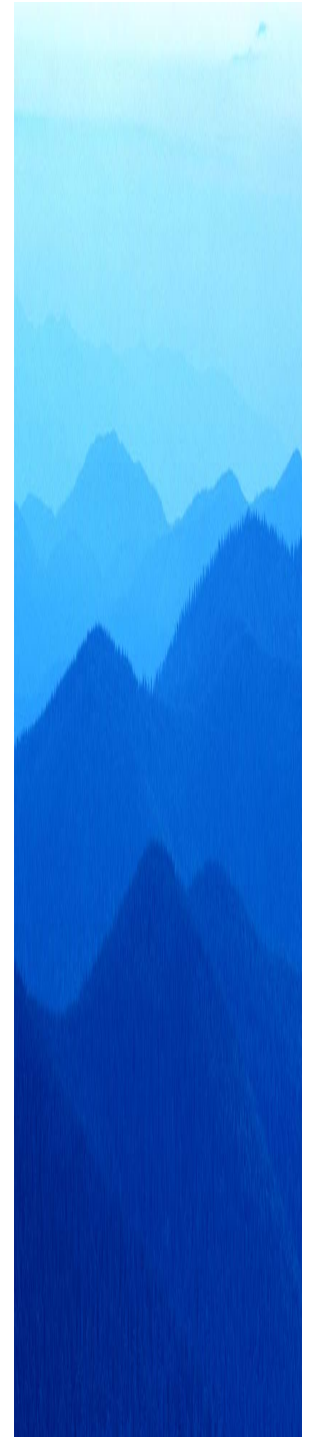


# Emission Reductions in Compressor Stations as a CDM Project: Moldova Project

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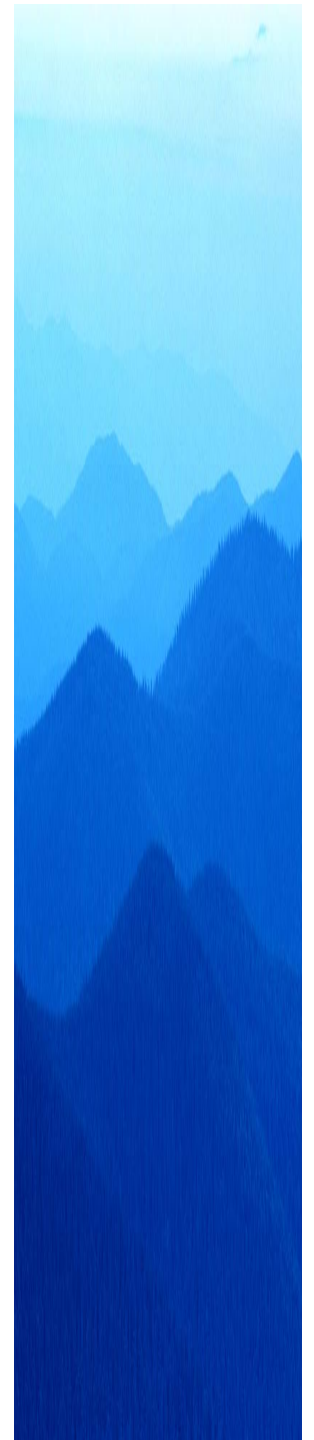
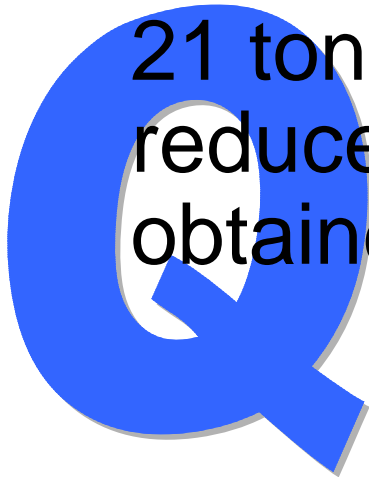
*María Ana Gonzalez  
QualityTonnes*

*November 3<sup>rd</sup>, 2005*



# Methane Reduction Projects

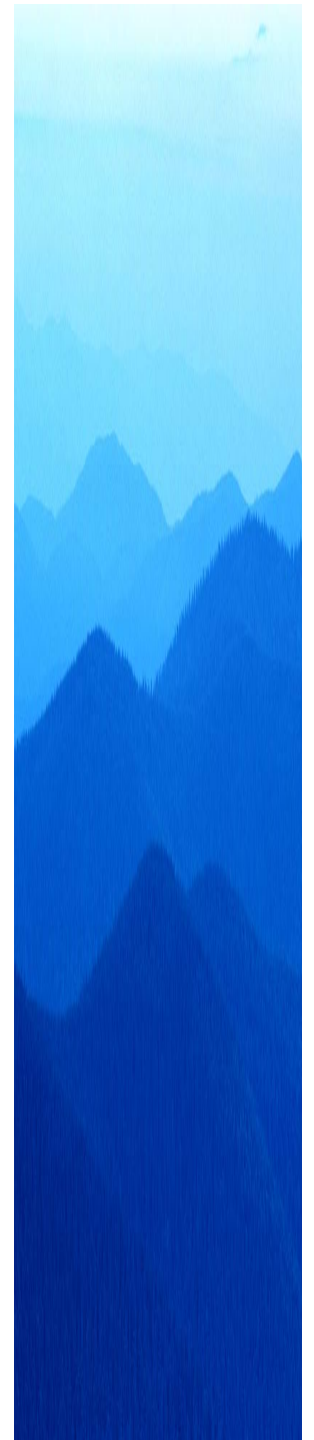
- Kyoto includes six gases, each one with a different weighting, or greenhouse gas potential.
- Methane has a greenhouse gas potential of 21.
- For every tone of methane reduced, 21 tones of CO<sub>2</sub> equivalent are reduced and 21 credits (CERs) are obtained.



# Leakage in Compressor Stations

- According to a study done by Gas Research Institute on 17 compressor stations in the US:
- 10 to 20% of the leaks are responsible for 80 to 90% of the emissions => low investment required.
- The study consisted in measuring the leaks and calculating the average emission factor for each component.

Source: Gas Research Institute, "Leak Rate Measurements at U.S. Natural Gas Transmission Compressor Stations".

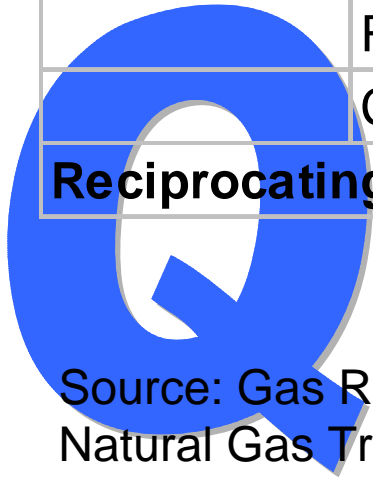
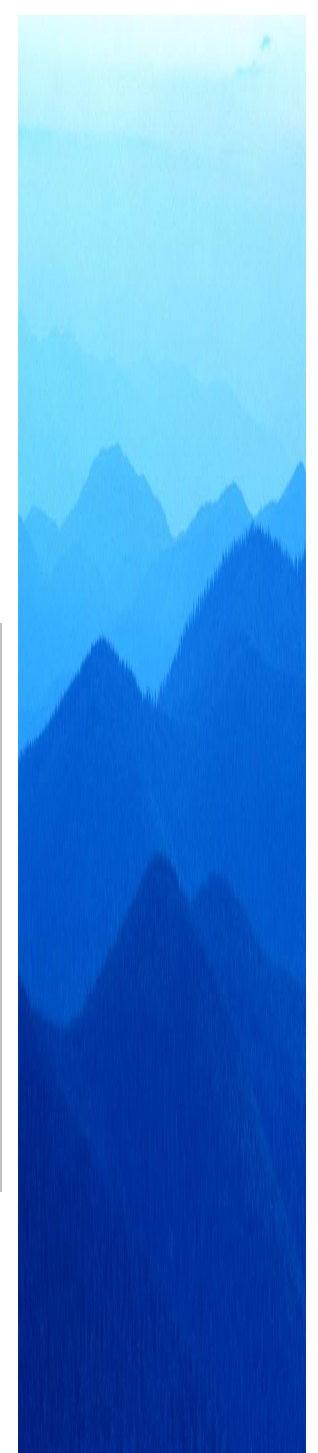


# Leakage in Compressor Stations

Most leaks are found in the following components; on average their emissions in scfy (standard cubic feet per year) are:

<b>Suction/discharge valves in blowdown compressors</b>			
	Reciprocating	1,37 x 10 <sup>7</sup>	
	Centrifugal	1,05 x 10 <sup>7</sup>	
<b>Blowdown valves in pressurized engines</b>			
	Reciprocating	1,33 x 10 <sup>6</sup>	
	Centrifugal	4,22 x 10 <sup>6</sup>	
	<b>Reciprocating Rod Packings</b>	7,03 x 10 <sup>5</sup>	

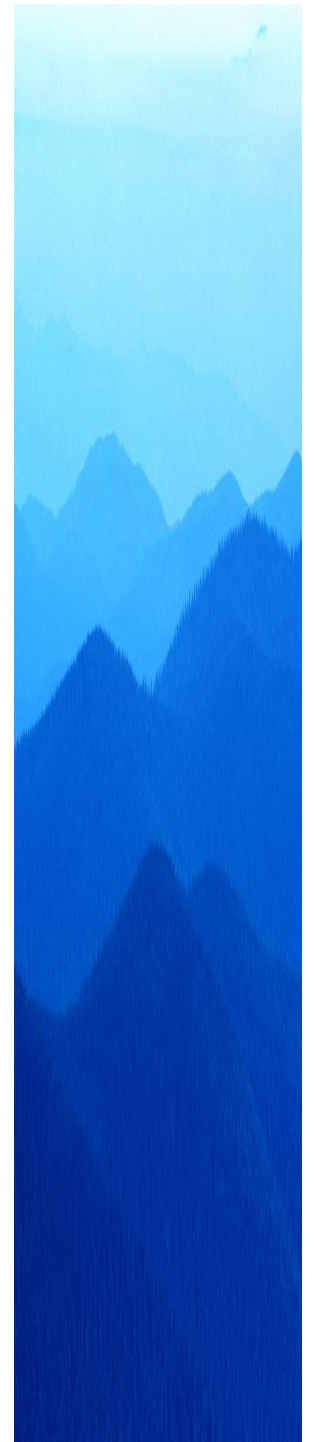
Source: Gas Research Institute, "Leak Rate Measurements at U.S. Natural Gas Transmission Compressor Stations".



# Additionality

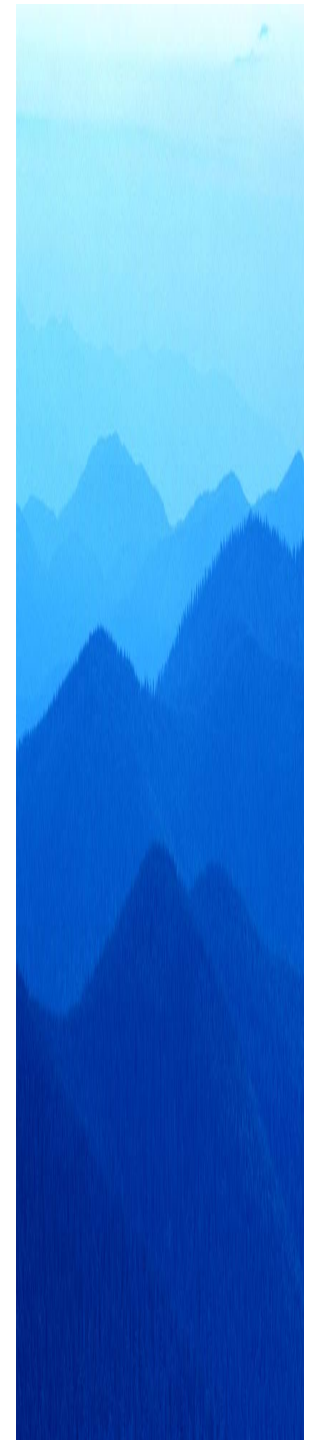
- To present a project as a CDM project, additionality has to be proven.
- A project is additional if you can prove that the project would not have been implemented without the CDM.

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# Additionality in Moldova Project

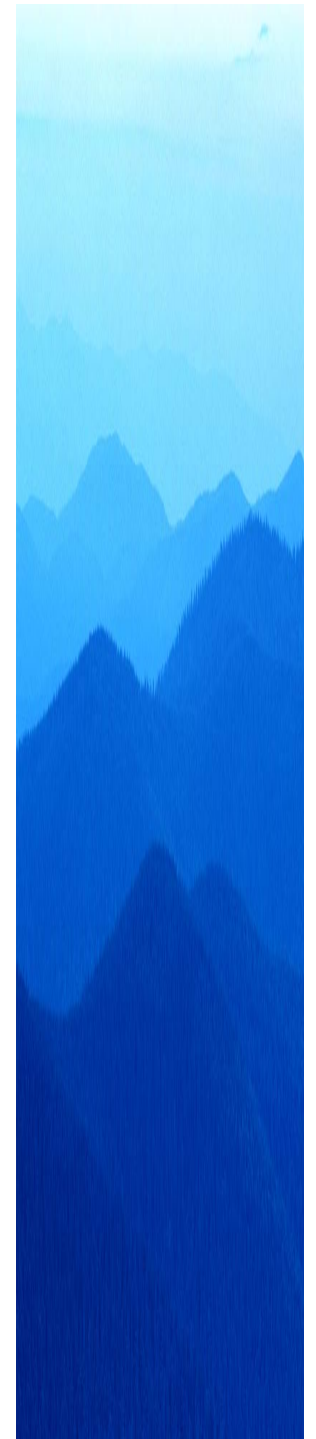
- Gas transportation companies don't have to pay for their lost gas => CDM is the only incentive to improve the leak detection procedures.
- Even if regulation requires companies to fix their leaks, the project is still additional as the usual leak detection technology is not appropriate for all leaks.
- CDM allows for this new technology to be introduced.



# High-flow Sampler

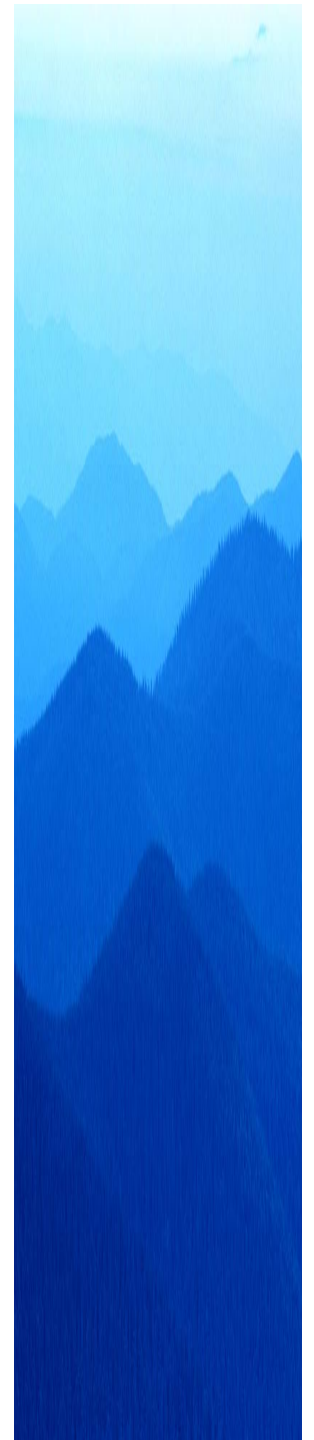
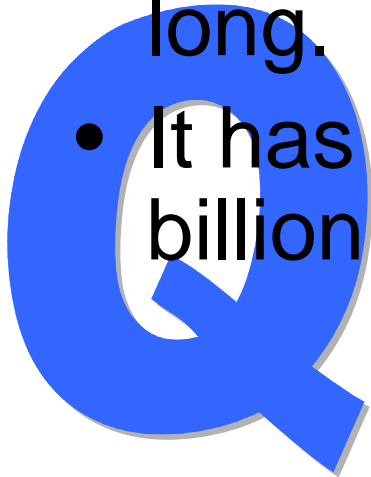
- Performs rapid and accurate leak measurements
- It measures the sample flow rate of air; the concentration within the sample; the concentration in the background air  
$$\text{Leak Rate} = \text{Flow Rate} \times (\text{sample concentration} - \text{background concentration})$$
- It has a maximum measuring capacity of 10 scf per minute.
- It is intrinsically safe

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# Moldovatransgaz

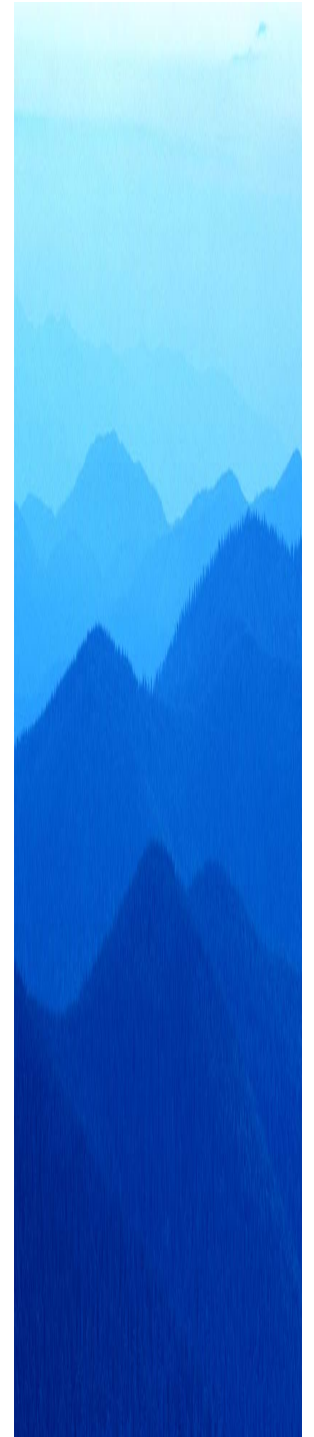
- Moldovatransgaz is a natural gas transmission company.
- It has 2 compressor stations with total of 9 engines and an installed power of 96 MW.
- The high-pressure system is 1737 km long.
- It has a transportation capacity of 26 billion m<sup>3</sup> per year (920 billion scfy).





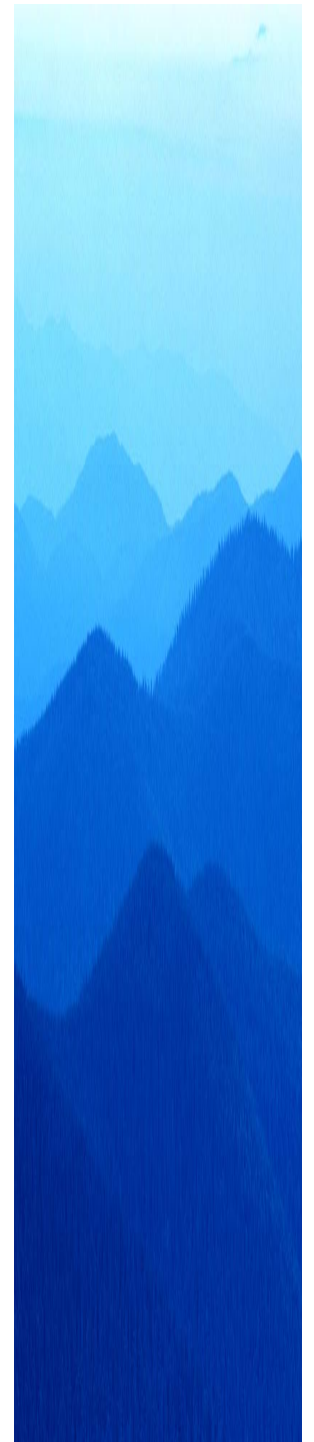
# Developing the Baseline Methodology

- Calculate baseline emissions in compressor station – leak survey specifying:
  - # of leaks
  - leak rate
- Adjust for changes in pressure, hours of operation, etc.
- Always good to be conservative.



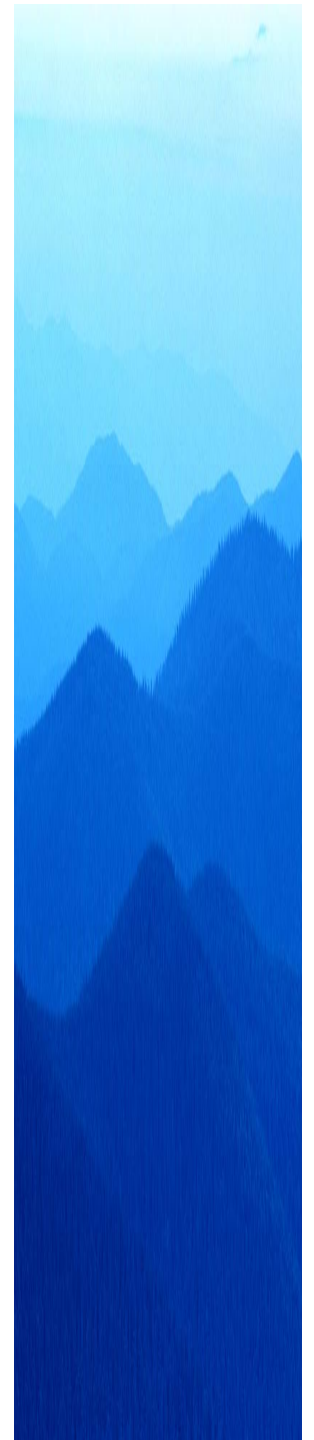
# Developing the Baseline Methodology

- Clear analysis of the leak reduction practices already taking place.
- Distinguish what is fixed anyway (emergency leaks, leaks in certain areas, etc.)
- Separating by category leaks that have never been looked at (maybe leaks that are hard to reach or detected using certain technologies).



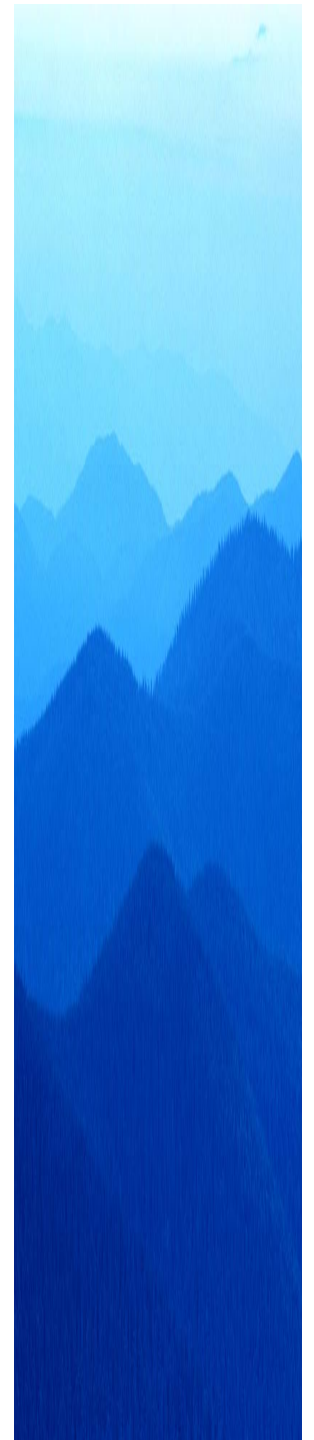
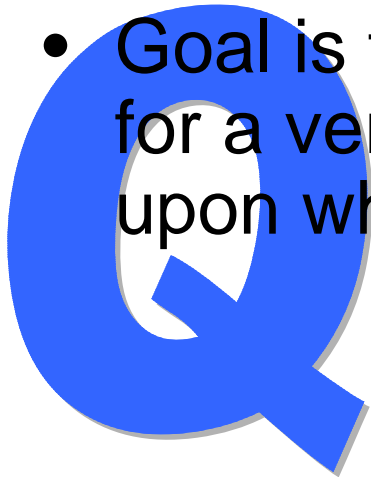
# Other Issues

- Assess environmental impacts (and how they are mitigated)
- Leakage (does the project itself generate GHG emissions). This will be in monitoring plan.
- How have outside stakeholders been engaged and how have their concerns been taken into account?



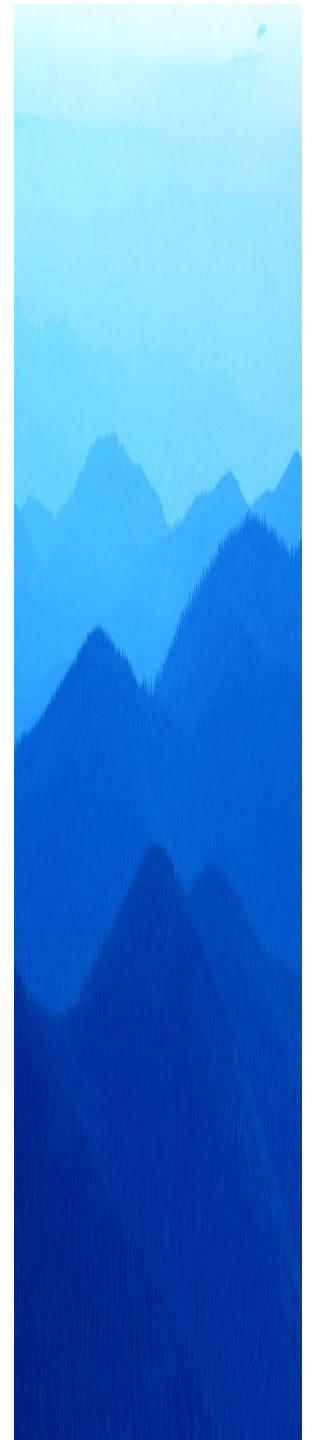
# Monitoring Plan

- Need to list data that will be collected (leak rate in baseline, leak rate during project year).
- Frequency of monitoring, who will collect, what management structure will be established to do the monitoring.
- How will the data be filled and organized for a verifier?
- Goal is to make things as easy as possible for a verifier since they write the reports upon which CERs issuance is based.



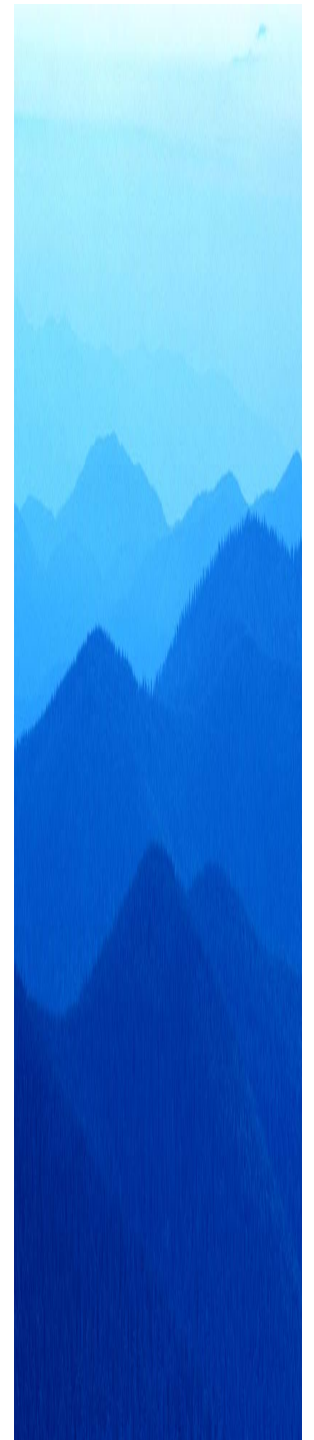
# Risks to Investor

- “Accreditation” Risk (to gain credits from CDM Board) – low as the project is approved.
- Performance Risk – moderate as the project requires frequent and accurate monitoring; will need to train staff on collecting data in accordance to methodology.



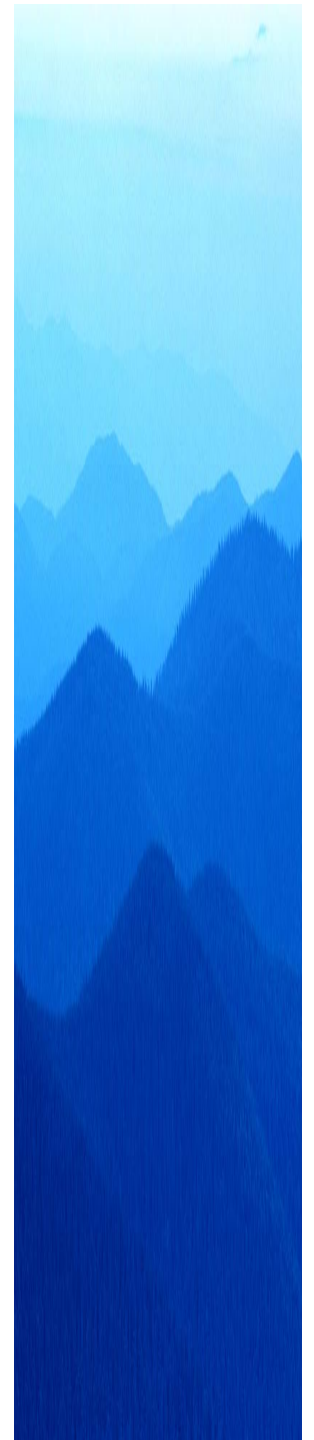
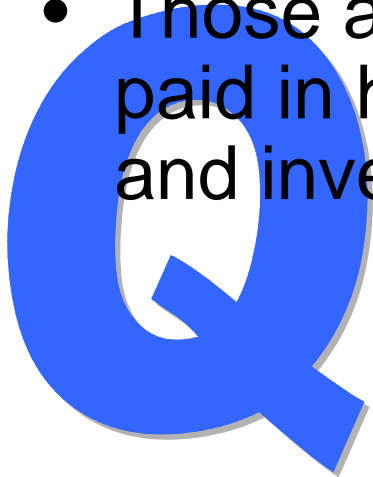
## Risks (con't)

- Political/Country Risk – moderate; Moldova is a relatively stable, but the economy is weak. CDM project also requires host-gov't approval.
- Contract Risk – moderate; contract law is relatively weak, but improving. Moldovatransgaz owes debts to Russia
- Financial Risk – low; project is relatively small but very good payback.



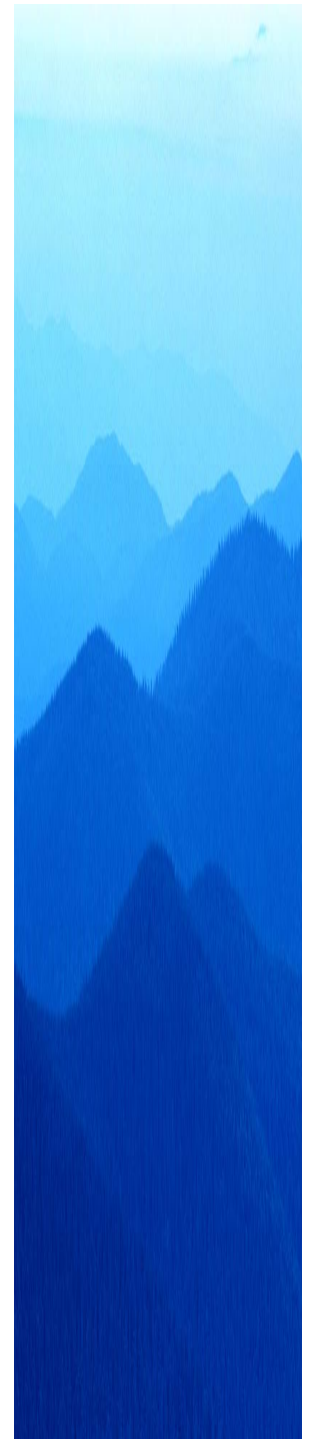
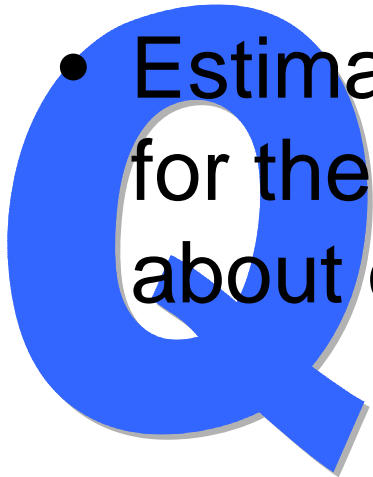
# Risks (Conclusion)

- Moldova is a challenging place to do business.
- CDM mitigates risk of this project because credits are generated by the emission reductions; does not require actual payment from Moldovatransgaz– just the activity by their staff to lower emissions.
- Those actions trigger the credits, which are paid in hard currency from buyer to seller and investor.



# Status of the Project

- Project is approved by CDM Board.
- This means the project will qualify for CDM credits.
- Financing can now be arranged and a number of private investors are interested.
- Estimates that carbon finance will pay for the baseline study and repairs in about one year.





# Contact Information

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