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Focus on the economics of climate change
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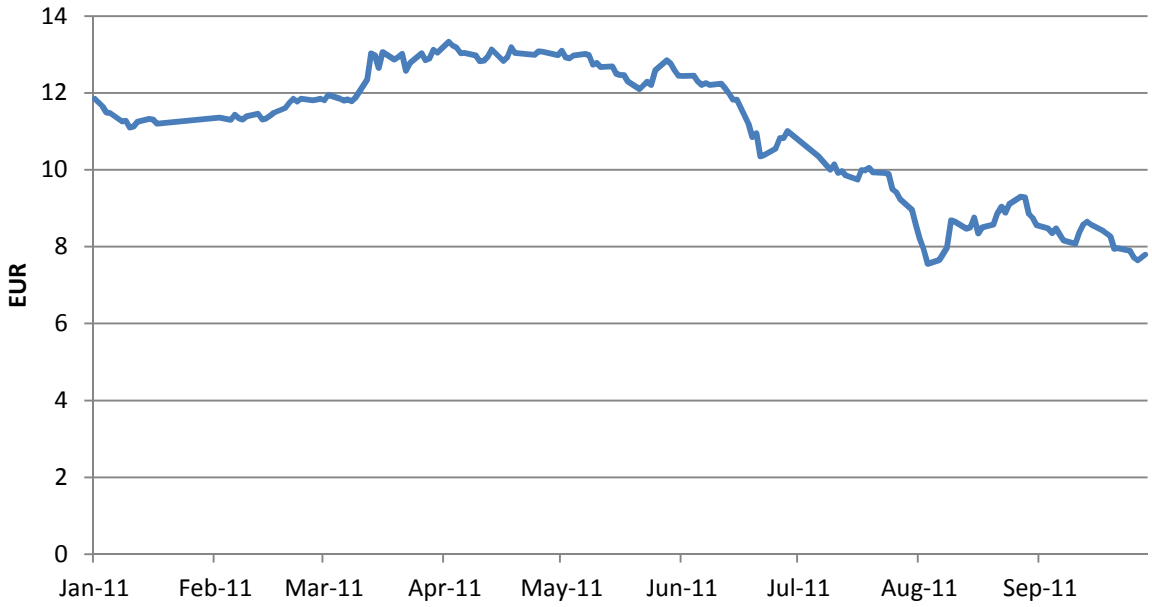
Annex 1 – ERU spot price



Source: BlueNext, October 2011.

Annex 2 – ERU supply forecasting model

In order to estimate the potential ERU supply by April 30, 2013, we adapted the CER supply forecasting model developed by CDC Climat Research (Cormier A., Bellassen V., 2011) and conducted several manual adjustments in order to accommodate for the specifics of the JI mechanism. The model is based on the data available from open sources (UNEP Risoe JI Pipeline, country registries of carbon units) as well as information obtained from the interviews (see the bibliography section).

The ERU supply forecast is defined in Equation 1.

Equation 1 – ERU supply forecast

$$\textit{ERU supply forecast} = \textit{ERU amount expected in the PDD} \times \textit{issuance probability} \times \textit{issuance success rate}$$

Issuance probability

Status issuance probability (from 0 to 1) estimates the probability that the project will issue ERUs based on its current status according to Table 1.

Equation 2 – Issuance probability (from 0 to 1)

$$\textit{Issuance probability} = \textit{status issuance probability} \times (1 - \textit{probability to get bogged down})$$

by Igor Shishlov, Research Fellow, igor.shishlov@cdcclimat.com

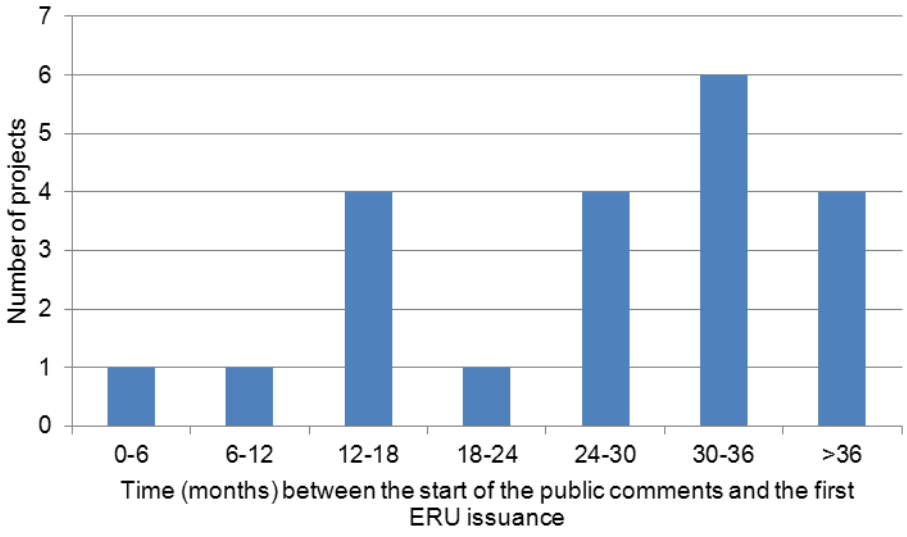
Table 1 – Status issuance probability

Status	Status issuance probability	Comments
Registered and issued	1	We assume that projects that had already managed to issue ERUs will be able to do so in the future.
Registered	1	All registered projects are expected to issue ERUs unless they are bogged down.
Registration requested	1	These Track 2 projects are very likely to get registered: historically all projects that requested registration, except one, got registered.
At determination	0	These Track 2 projects are unlikely to get registered: out of 250 Track 2 projects in the pipeline only 30 have been registered with an average registration speed of 8 projects per year.
Withdrawn / Rejected	0	These projects will never get registered.

Probability to get bogged down (from 0 to 1) estimates the probability that the registered project will never issue ERUs due to implementation or verification issues.

For Track 2, available data does not allow to make a clear conclusion regarding the delay between registration and first issuance (Figure 1): projects may first issue ERUs more than three years after their registration. Therefore the probability to get bogged down is assumed to be 0 for Track 2 projects.

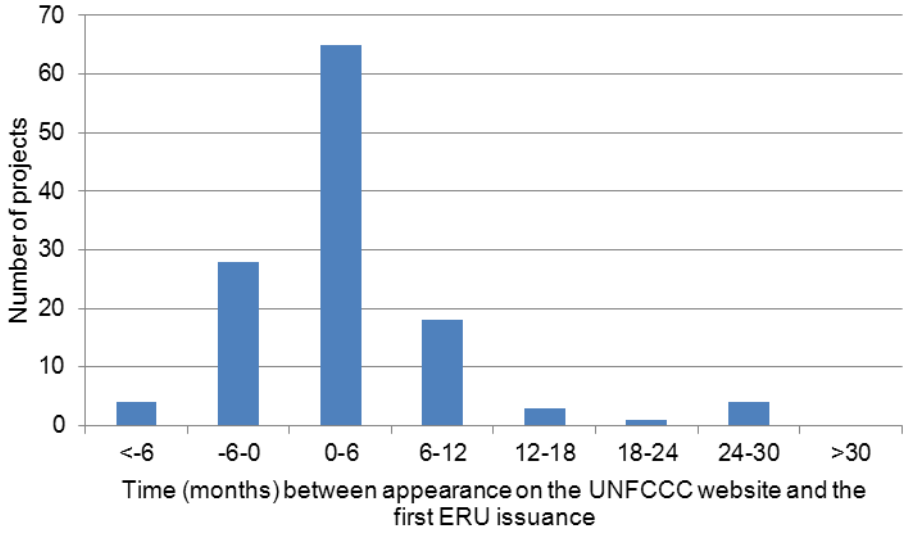
Figure 1 – First issuance delay (Track2)



Sources: CDC Climat Research based on UNEP Risoe JI Pipeline data, October 1, 2011.

For Track 1, 93.5% projects issued ERU within 1 year after the project appearance on the UNFCCC website (Figure 2).

Figure 2 – First issuance delay (Track 1)



Sources: CDC Climat Research based on UNEP Risoe JI Pipeline data, October 1, 2011.

Given a possible delay in information exchange, the threshold is conservatively set at 18 months: Track 1 projects which have not issued any ERUs 18 months after their first appearance on the UNFCCC website are considered to be bogged down. The probability to get bogged down (Track 1) is thus estimated according to the following table.

Table 2 – Probability to get bogged down

Project status and date of appearance on the UNFCCC website	Probability to get bogged down	Comments
Registered and Issued	0	We assume that projects that had already managed to issue ERUs will be able to do so in the future.
Registered and appeared on the website less than 18 months ago	0.2	These projects have a 20% chance to get bogged down. The probability is calculated based on Equation 3.
Registered and appeared on the website more than 18 months ago	1	These projects are considered to be bogged down and thus will not issue ERUs.

Equation 3 – Probability to get bogged down (for projects that appeared on the UNFCCC website less than 18 months ago and have not issued ERUs yet)

$$Probability\ to\ get\ bogged\ down\ at\ inssuance = \frac{number\ of\ projects_{with\ inssuance}}{number\ of\ projects_{with\ inssuance} + number\ of\ projects_{bogged\ down\ at\ issuance}}$$

Issuance success rate

For projects with issuances *the issuance success rate* is estimated according to **Equation 4**.

Equation 4 – Issuance success rate

$$Issuance\ success\ rate\ = \frac{ERUs_{issued}}{ERUs_{expected\ for\ the\ same\ period\ (based\ on\ PDD)}}$$

For projects without issuances the expected issuance success rate is estimated according to Equation 5.

Equation 5 – Expected issuance rate

$$\begin{aligned} &Expected\ issuance\ success\ rate\ = \\ &average\ country\ issuance\ success\ rate \times 0.5 \\ &+\ average\ type\ issuance\ success\ rate\ \times 0.5 \end{aligned}$$

The weights of 0.5 for country risk and type risk are assigned based on calculation of correlations between these two factors and the issuance success rate for projects with issuances as well as the expert judgment and the conclusions of the CER supply forecasting model. Two other factors (project size and JI Track) were taken into consideration, but later excluded, since they are highly collinear with type and country factors respectively.

Assumptions

Since the publicly available information about JI projects is limited, several assumptions were made based on the qualitative information obtained throughout the course of the research, namely:

1. All projects that will issue ERUs are expected to do it by April 30, 2013. We are aware of the time lag between the end of the monitoring period and the actual issuance; however, we suppose that most projects will do their best to issue ERUs by April 30, 2013, in order to fit in the offset limit set for the second phase of the EU ETS.
2. Ukraine and Romania are currently suspended from JI Track 1 transactions, but we expect that the ban will be lifted by spring 2012. Thus the total ERU supply for the period of 2008-2012 will not be affected considerably.
3. The two Russian HFC-23 projects (RU1000201 and RU1000202) are expected to issue up to 41.5 million ERUs versus 7.5 million planned in their PDDs.