

# Carbon Credit Project Development

**Hanna-Mari Ahonen**

Nordic Environment Finance Corporation (NEFCO)

Carbon Finance and Funds

Carbon Emissions Trading 2009 | Warsaw, 1 July 2009

# Topics

- NEFCO Carbon Finance and Funds (CFF)
- 
- Overview of Joint Implementation project cycle
  - Baseline setting and additionality
  - Contracting of carbon credits
  - Monitoring, issuance and transfer

## NEFCO in a nutshell

- International Financial Institution established in 1990 by Denmark, Finland, Iceland, Norway and Sweden
- Around 340 million euro and 350 projects under management
- Geographic scope: primarily Russia, Ukraine and Belarus, also Baltic States
- Financing for projects that generate positive environmental effects
- Priority on projects that reduce greenhouse gas emissions or toxic pollution or improve the environmental state of the Baltic Sea
- Acts as Fund Manager for various environmental funds

# NEFCO Carbon Finance and Funds

- NEFCO is Fund Manager of two public-private carbon funds
  - Baltic Sea Region **Testing Ground Facility (TGF)**, JI fund that buys Kyoto period ERUs from projects in Russia, Ukraine and Baltic States, launched 2003, €35 million
  - **NEFCO Carbon Fund (NeCF)**, global CDM/JI fund that buys Kyoto and post-Kyoto credits, launched spring 2008, €87 million
- 120+ million euro and 30+ projects under management
- Most projects concern **renewable energy & energy efficiency**

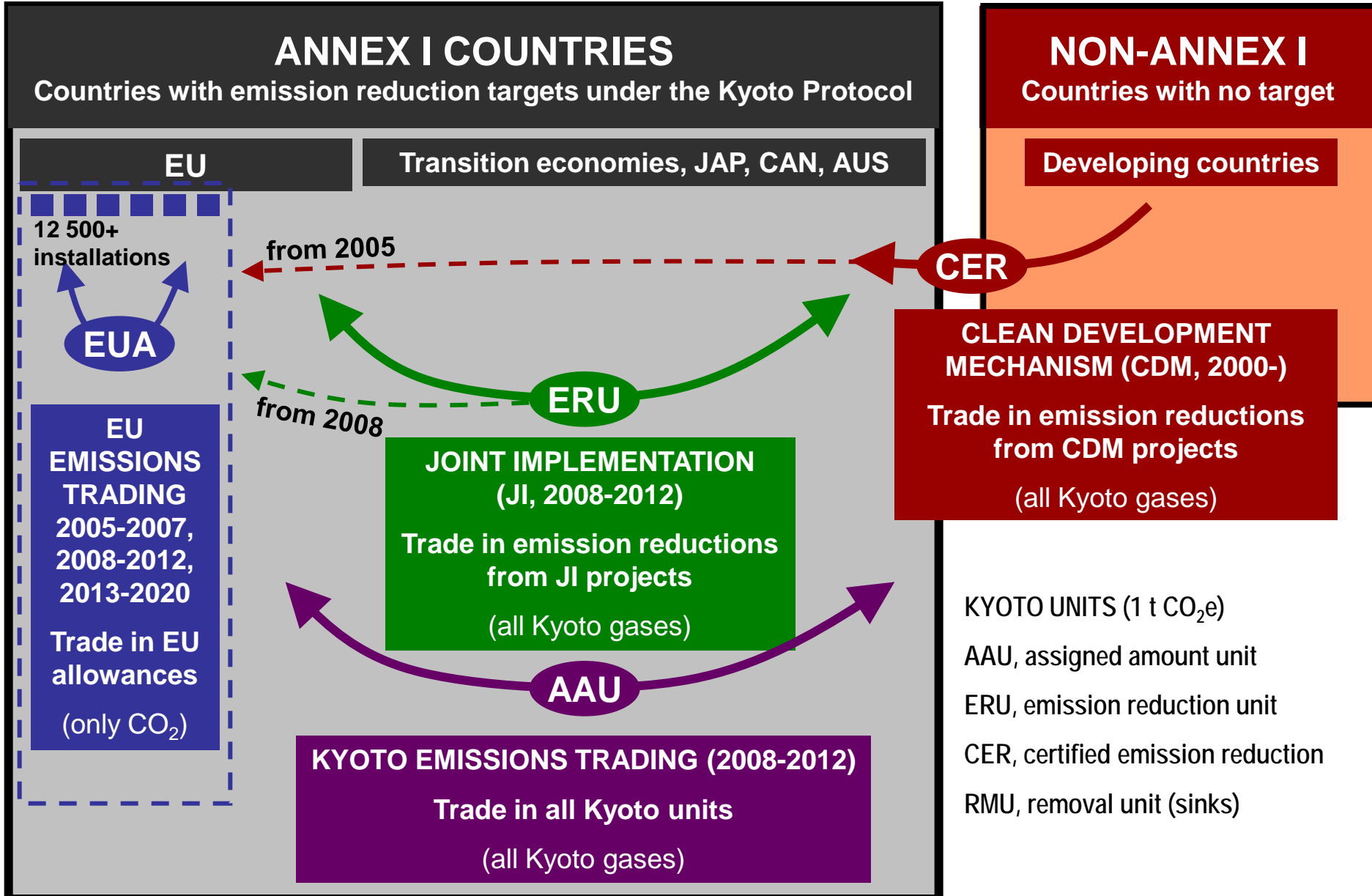
# Topics

- NEFCO Carbon Finance and Funds (CFF)
  - Overview of Joint Implementation project cycle
- 
- Baseline setting and additionality
  - Contracting of carbon credits
  - Monitoring, issuance and transfer

# Joint Implementation (JI) in a nutshell

- JI is a project-based **market mechanism**, aimed at increasing flexibility and cost-effectiveness of reducing greenhouse gas emissions under the Kyoto Protocol
- JI countries are **countries with emission caps** under the Kyoto Protocol
- Project activities that reduce emissions of greenhouse gases **beyond business-as-usual levels** can be approved as JI projects
- JI projects undergo *ex ante* **third party independent assessment** (determination) of project design and *ex post* independent verification of realised emission reductions.
- JI projects need **approval of relevant host and investor countries**
- JI projects earn **Emission Reduction Units (ERUs)** against verified emission reductions (1 ERU = 1 tonne of carbon dioxide equivalent of emission reductions)
- Project **owners can sell ERUs** to governments (and companies) that use ERUs for compliance under the Kyoto Protocol (and the EU Emissions Trading Scheme)
- Sale of ERUs offers an **additional revenue stream for climate-friendly projects**

# Carbon market schemes



## Key concepts

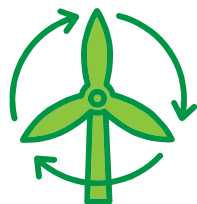
- **Carbon finance:** revenue from sale of carbon credits
  - **Carbon credit:** emission reduction generated by a CDM/JI project and verified and issued in accordance with CDM/JI rules; one carbon credit is one tonne of carbon dioxide equivalent (CO<sub>2</sub>e)
  - **Emission Reduction Unit (ERU):** carbon credit from JI project
  - **Baseline:** most likely scenario in the absence of the CDM/JI project
  - **Additionality:** CDM/JI projects must show that carbon finance offers critical leverage for the implementation of the project, i.e. without carbon finance, the more polluting baseline scenario would occur
- ▶ Carbon finance must be considered at early stages of the project, at least before final investment decision is taken

# Key considerations in JI projects



**Host country** approval is key criteria for JI eligibility

- ▶ Approval processes vary significantly across countries
- ▶ Russia: no approvals yet vs. Ukraine: around 40 approved projects



**Project type** influences applicable methodology and likely performance

- ▶ Waste projects: 25% vs. industrial processes >100% of expected credits



**Baseline** (alternative scenario) defines the emission reduction potential

- ▶ The "dirtier" the baseline, the higher the emission reduction potential
- ▶ Business-as-usual is not always a credible baseline!



**Financing** includes conventional financing and carbon finance

- ▶ Carbon financing typically only 5-20% of total (payment on delivery)
- ▶ Gas destruction projects can get up to 100% from carbon financing



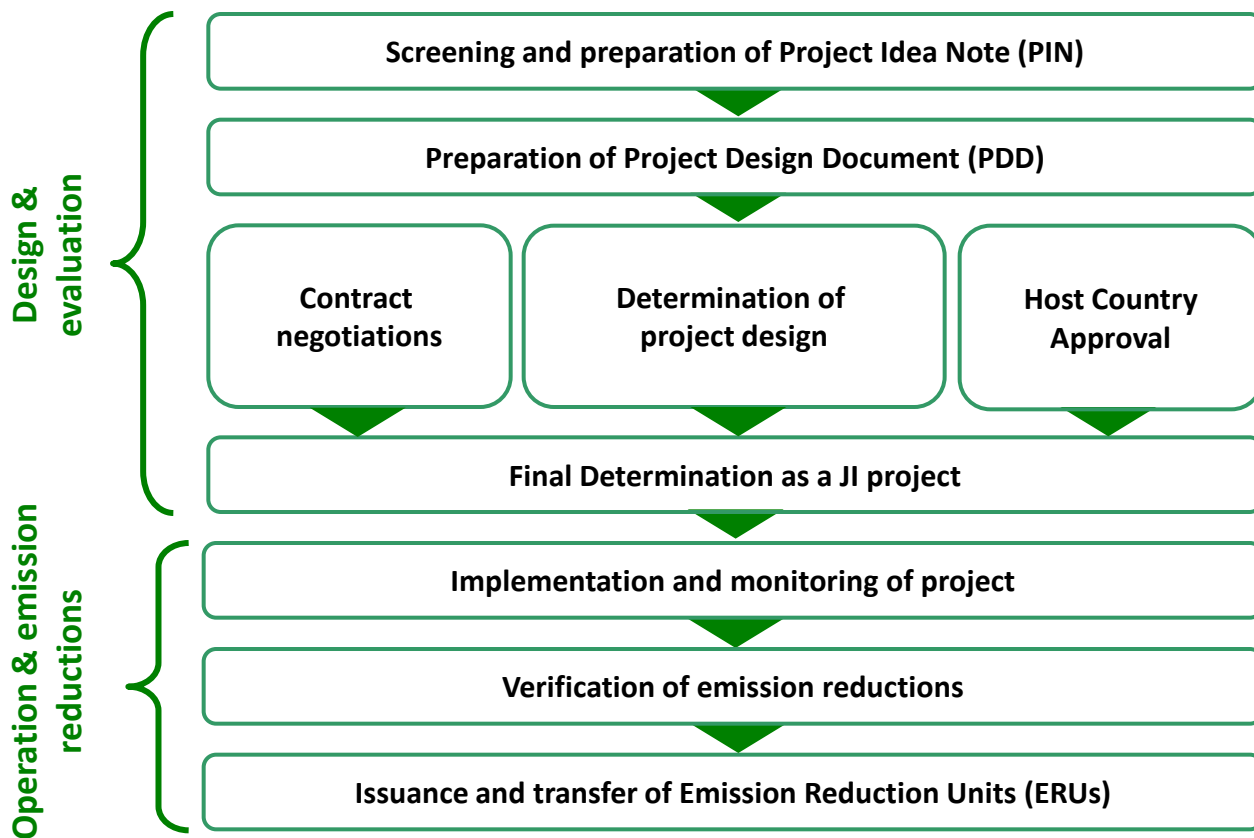
**Sustainable development benefits** of JI projects include reduced local air pollution, improved energy security and new employment opportunities

## Two tracks of JI

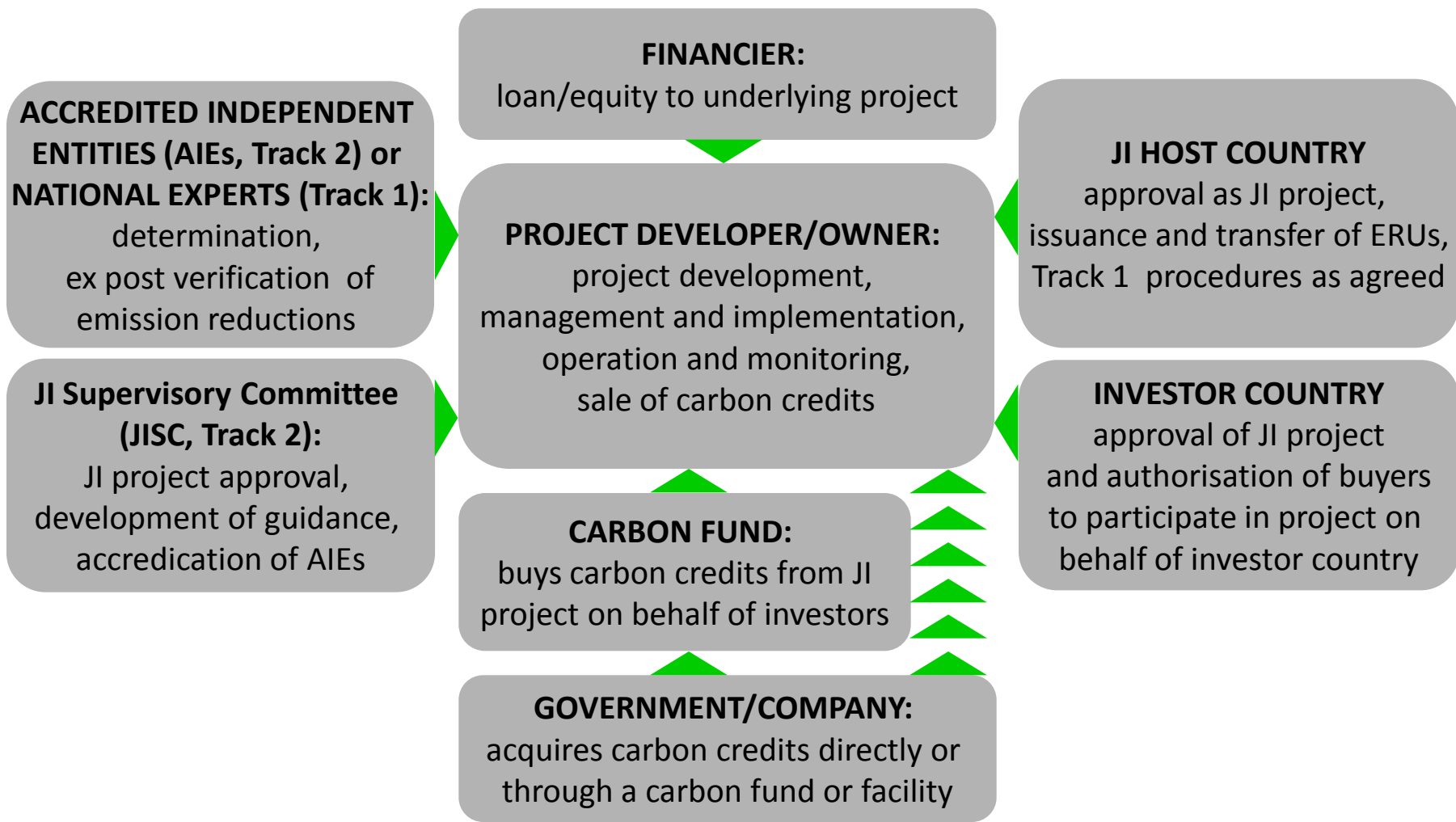
- International "**Track 2**" under the JI Supervisory Committee
  - for projects in host country that meet only minimum eligibility criteria
  - projects use UN formats and follow UN guidelines and procedures
- National "**Track 1**" under national authorities
  - for projects in host countries that meet full eligibility criteria
  - projects use national formats, guidelines and procedures
  - many Track 1 procedures utilise elements of Track 2
- Under both tracks:
  - host and investor country approval are required
  - host country issues and transfers ERUs once full eligibility criteria are met



# JI project cycle



# Key JI actors



## Key JI documents - technical

### **Project Idea Note (PIN) by project owner or consultant**

- optional document with basic information for screening JI potential
- technical info, financial status, baseline and preliminary calculations

### **Project Design Document (PDD) by consultant**

- detailed study on JI project using UN format and guidelines
- identification of baseline scenario and demonstration of additionality
- *ex ante* calculation of emission reductions and monitoring plan

### **Determination Report by Accredited Independent Entity (AIE)**

- assessment of PDD against JI rules and criteria

### **Monitoring Report by project owner**

- report of actual realised emission reductions

### **Verification Report by AIE**

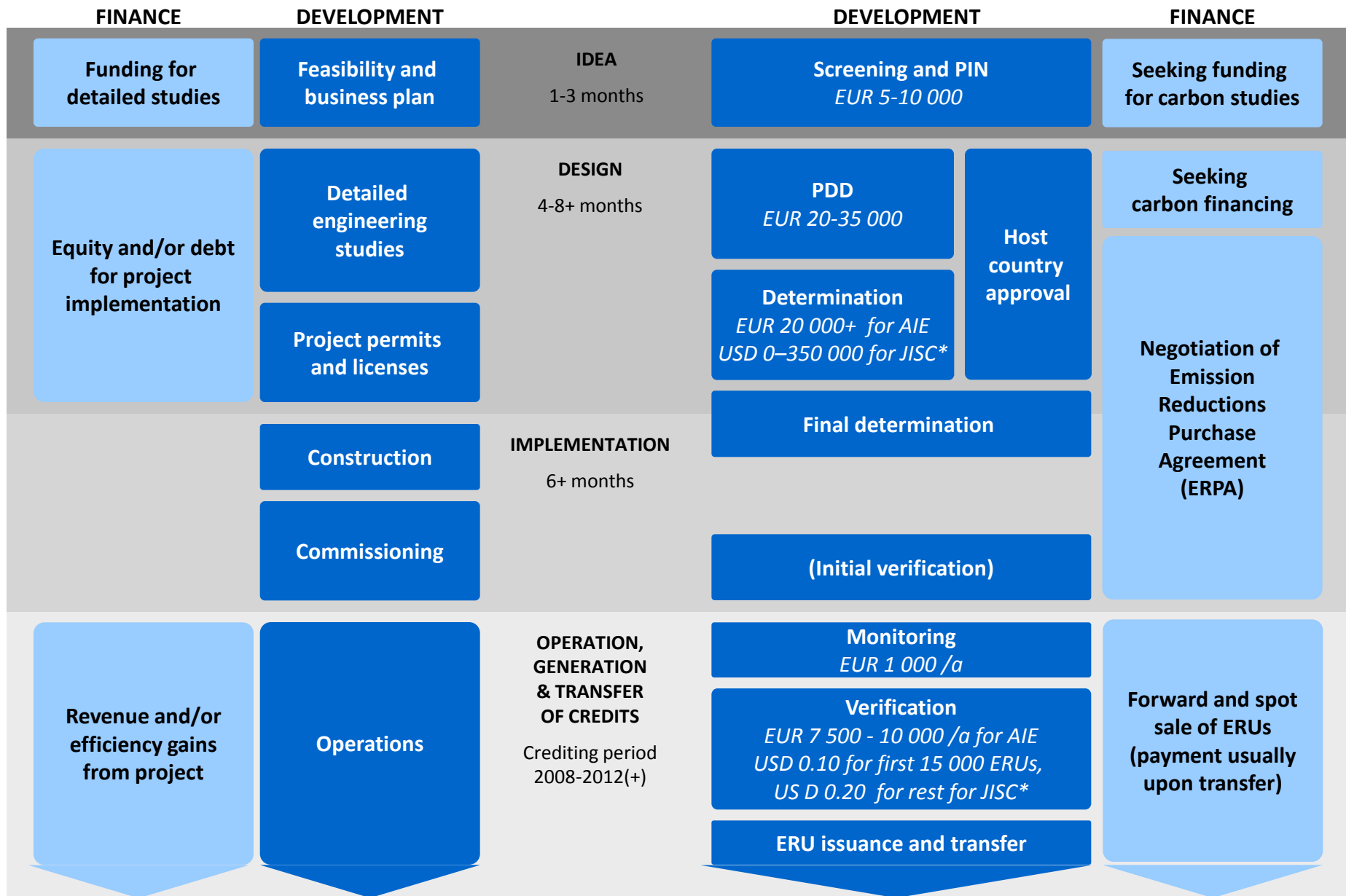
- verification of monitored emission reductions

## Key JI documents - legal

- **Letter of Endorsement (LoE) from host country**
  - optional indicative letter of support for the JI project
- **Letter of Approval (LoA) from host and investor countries**
  - required documents to confirm approval of project and authorisation of private project participants on behalf of seller and buyer countries
- **Option Agreement, Letter of Intent (or similar) by buyer and seller**
  - optional pre-agreement on key terms and exclusivity period for negotiation of sale and purchase of ERUs
- **Emission Reductions Purchase Agreement (ERPA) by buyer and seller**
  - contract regarding the sale and purchase of ERUs

## UNDERLYING PROJECT

## Jl CARBON COMPONENT



\* JISC fees apply only to JI projects that follow Track 2 procedures; JISC determination fee is deducted from JISC verification fee

# Topics

- NEFCO Carbon Finance and Funds (CFF)
  - Overview of Joint Implementation project cycle
  - Baseline setting and additionality
- 
- Contracting of carbon credits
  - Monitoring, issuance and transfer

## Baseline setting

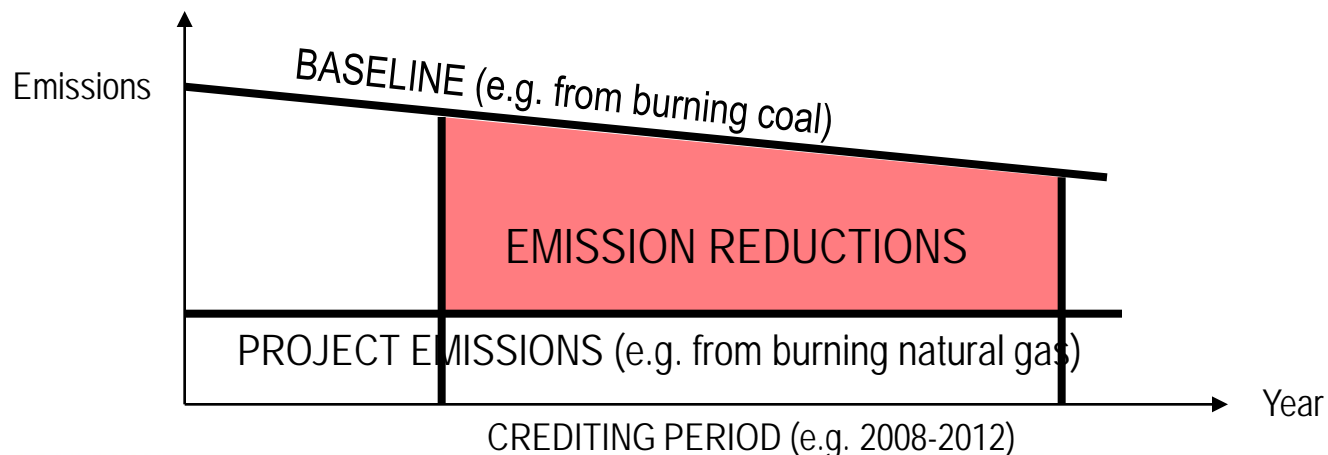
- Baseline: scenario that reasonably represents the greenhouse gas emissions that would occur in the absence of the proposed project
- Baseline can be set by identifying and listing plausible future scenarios on the basis of conservative assumptions and identifying the most plausible one
  - Baseline can be project-specific and/or based on a multi-project emission factor
  - Project-specific or CDM methodologies allowed
  - Transparent, conservative choice of approaches, assumptions, methodologies, parameters, data sources and key factors
  - Consideration of relevant national/sectoral policies

## Additionality

- JI project must provide "a reduction in [greenhouse gas] emissions [...] that is **additional to any that would otherwise occur**".
- JI project must show that, without ERU revenue, the project is not the most likely (baseline) future scenario, for example because:
  - the proposed JI project is not required by law
  - investors/owners have more attractive options with higher financial return
  - the project faces investment or technology barriers
- Under Track 1, host country determines additionality
- Under Track 2, CDM tools and JISC guidance are available

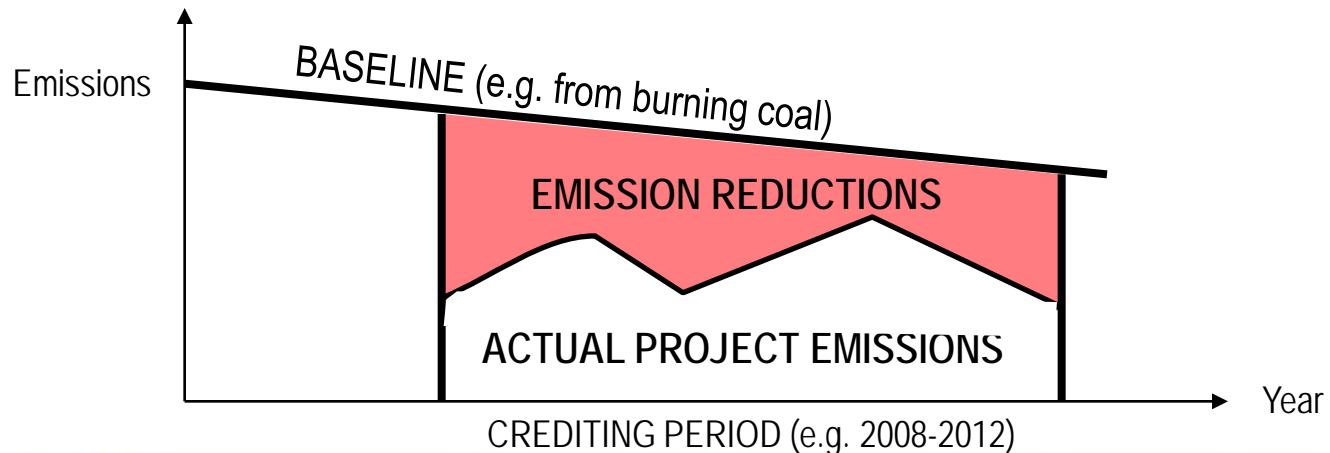
# Estimation of emission reductions

- Project-specific baseline and additionality demonstration
- Baseline = most likely, credible emission path without JI/CDM project
- Additionality = JI project (e.g. natural gas plant) reduces emissions *compared to baseline* (e.g. coal plant)
- Carbon credits (ERU) generated and measured *against baseline*
- Emission reductions = baseline emissions – project emissions



# Realised emission reductions

- Actual project or baseline emissions may differ from the estimation
- Monitoring is required to ensure that ERUs are issued against actual emission reductions
- Monitoring reports and data are verified by independent auditor





## Benaičiai Wind Park, Western Lithuania

**Project:** Wind park of 6 x 2,75 MW wind turbines

**Category:** Renewable energy - wind

**Baseline:** Electricity generation with fuel oil and gas

**Emission reductions:** 131,000 tCO<sub>2</sub>e (2007-12)

**Technology:** Vestas (DK)

**Financing:** Lease financing from local institution

**Carbon finance:** ~5% of total; 40% advance payment

**Project status:** Operational since 2007

**Jl cycle status:** Final JI status achieved July 2008; First verification of emission reductions ongoing

### Sustainable development benefits:

- ⌘ Health benefits via reduced local air pollution
- ⌘ Local employment opportunities
- ⌘ Contribution to national energy security



Source : [www.vestas.com](http://www.vestas.com)





## Khimprom Waste Coke Gas Utilisation, Western Siberia, Russia

**Project:** Construction to two steam boilers in Khimprom chemical plant to utilise waste gas from a nearby coke plant

**Category:** Energy efficiency

**Baseline:** Steam production with natural gas and coal at Khimprom, and flaring of waste coke gas at the coke plant

**Emission reductions:** 354,000 tCO<sub>2</sub>e (2008-2012)

**Technology:** Byisk Boilers Works (RU)

**Financing:** Own equity, short-term loans

**Carbon finance:** ~75% of total

**Project status:** Implemented

**JI status:** Determination successful, seeking host country approval

**Sustainable development benefits:**

- ⌘ Reduced local air pollution
- ⌘ Reduced fuel costs to companies



*Existing Gas Boilers*



*Old Natural Gas Pipeline*



## Belokurikha District Heating Fuel Switch and Energy Efficiency, Altai, Russia

**Project:** Construction of new boiler houses to allow switch from mazut to biomass and natural gas and the shut-down of an outdated and oversized combined heat and power plant

**Category:** Fuel switch and energy efficiency

**Baseline:** Inefficient heat and power generation with coal

**Emission reductions:** 396,230 tCO<sub>2</sub>e (2008-12)

**Financing:** Financed by own equity, local bank loans and advance payment for carbon credits

**Carbon finance:** ~20%

**Project status:** Operational

**Jl cycle status:** Determination successful; verification ongoing, seeking host country approval

**Sustainable development benefits:**

- ⌘ Reduced local air pollution
- ⌘ Stable heat supply





## Saaremaa Biogas Combined Heat and Power Plant, Estonia

**Project:** Biogas plant for combined heat and power production based on pig waste

**Category:** Waste-to-energy

**Baseline:** Methane emissions from manure tanks and electricity generation with oil shale

**Emission reductions:** 80,000 tCO<sub>2</sub>e (2006-12)

**Technology:** Ecomac (Belgium)

**Financing:** EU grants and commercial loans

**Carbon finance:** ~15% of total, 40% advance payment

**Project status:** Operational

**Jl cycle status:** Early determination completed

**Sustainable development benefits:**

- ⌘ Reduced local odour nuisance
- ⌘ Generation of fertilizing/soil improvement material





## Lapes Landfill Gas Utilisation, Central Lithuania

**Project:** Landfill gas collection and utilisation for heat (1.4 MW) and power (1.1 MW) generation

**Category:** Waste-to-energy

**Baseline:** Methane emissions from landfill until 1.1.2012, and heat and power generation with natural gas and mazut

**Emission reductions:** 152,000 tCO<sub>2</sub>e (2008-12)

**Financing:** Own equity, NEFCO's subordinated loan

**Carbon finance:** >25% of total, 40% advance payment

**Project status:** Operational

**JI status:** At determination

**Sustainable development benefits:**

- ⌘ Increased safety and less local pollution
- ⌘ Energy security and demonstration of technology
- ⌘ Local employment opportunities



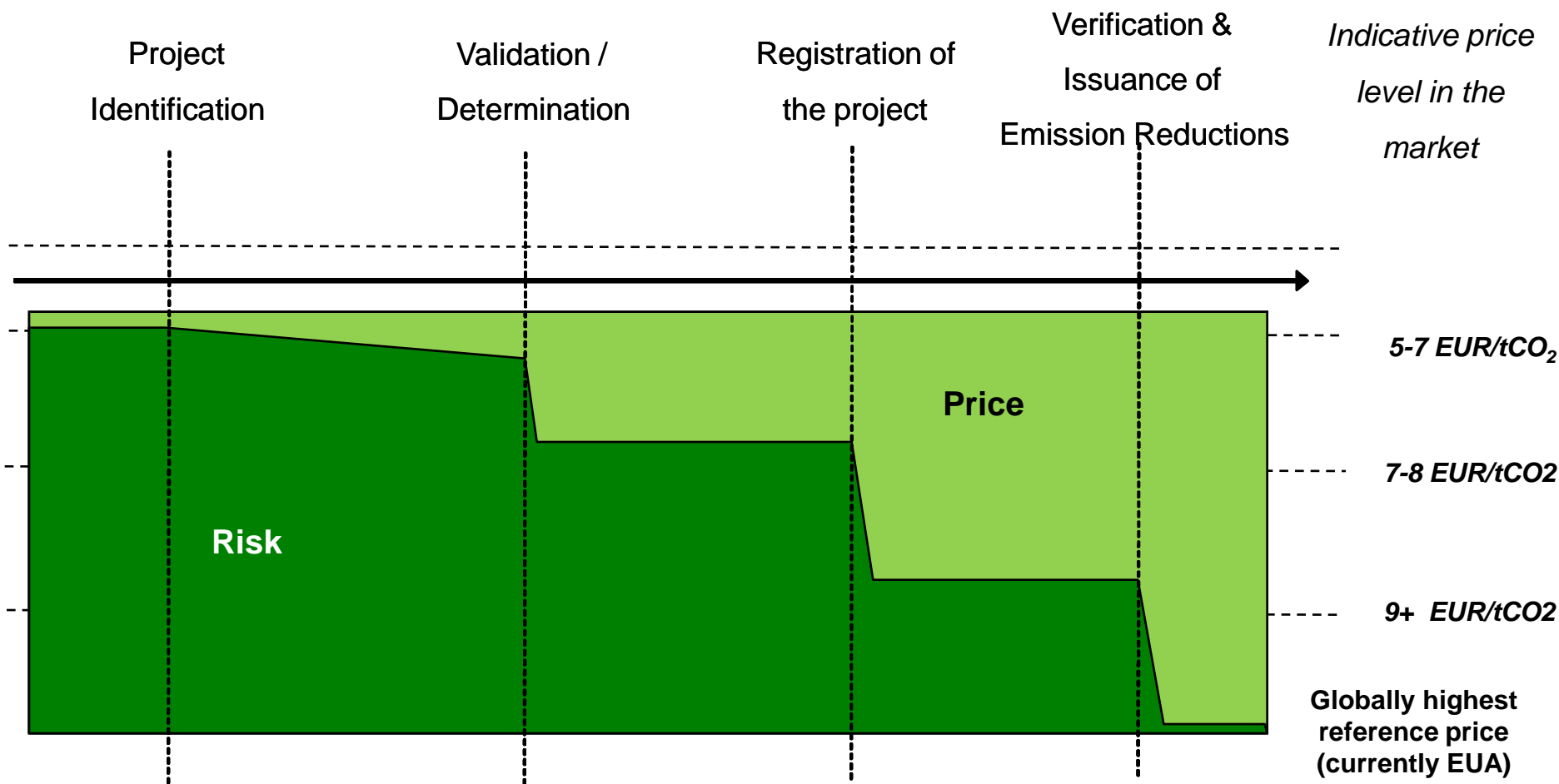
# Topics

- NEFCO Carbon Finance and Funds (CFF)
  - Overview of Joint Implementation project cycle
  - Baseline setting and additionality
  - Contracting of carbon credits
- 
- Monitoring, issuance and transfer

## Contracting of ERUs

- Project owners can find buyers through tenders
- Buyers also approach owners of potential JI projects directly
- Option Agreement or similar ensures exclusive negotiation period and releases resources for project development
- Emission Reductions Purchase Agreement (ERPA) is non-standard, project-specific, confidential contract on sale and purchase of ERUs
- ERPA defines:
  - contract price, volume and (tentative) delivery schedule
  - division of risks, costs and responsibilities (e.g. PDD, monitoring)
  - events of default and associated remedies and penalties
  - milestones and conditions precedent for ERPA

# ERU price depends on project stage and risks



# Topics

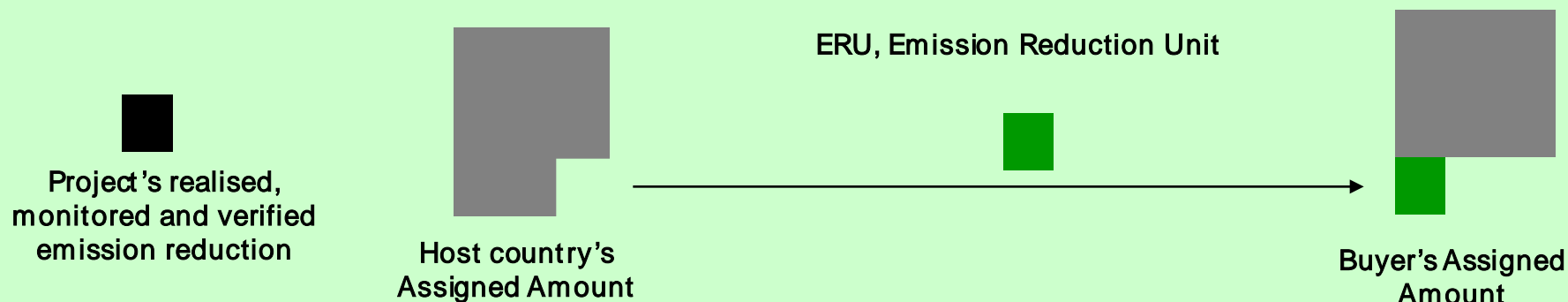
- NEFCO Carbon Finance and Funds (CFF)
  - Overview of Joint Implementation project cycle
  - Baseline setting and additionality
  - Contracting of carbon credits
  - Monitoring, issuance and transfer
-

# Monitoring

- Monitoring is critical (but often ignored) part of ERU generation
  - ERUs are lost if monitoring is not carried out appropriately
- Monitoring must strictly follow monitoring plan of final PDD
  - sometimes project is implemented before PDD is finalised, increasing the risk of inappropriate monitoring
- Keys to successful monitoring:
  - appropriate installation and use of monitoring equipment
  - regular calibration of equipment
  - establishment of monitoring management and quality assurance system, clear procedures and templates
  - proper training and motivation of all involved staff

# Issuance and transfer of ERUs

## JI, Joint Implementation



→ Total Annex I emissions remain unchanged

- Issuance and transfer done in host country registry against verified emission reductions; procedures vary across host countries
- Little experience with issuance and transfer of ERUs
  - first ERUs for JI projects in New Zealand, Germany and France
  - Ukraine has issued "early credit AAUs" for pre-2008 emission reductions of early mover JI projects

# Carbon Market Challenges & Opportunities

- **Tightening supply curve in the JI market**
  - UNFCCC system constraint: cannot keep up with market
  - AIE/DOEs constraints: understaffed and overworked
  - Track 2 procedures are slow; many projects stuck at determination
  - Closing window of opportunity for JI
- **Lack of predictability in the system**
  - Application of principles such as retroactivity of regulations or “presumptions of guilt”
  - Reforms have been proposed
- **Lack of market definition post-2012**
  - An opportunity for funds offering Kyoto and post-Kyoto purchases
  - Projects with post-2012 credits must start before the end of 2012
- Current low prices mean project owners unwilling to sell
- Selective opportunities exist, especially for developmental projects

**Thank you for your kind attention!**

For additional information,  
please visit [www.nefco.org/cff](http://www.nefco.org/cff)

**Contact our team:**

NEFCO Carbon Finance and Funds  
c/o Nordic Environment Finance Corporation (NEFCO)  
P.O. Box 249, FI-00171 Helsinki, FINLAND  
Phone: +358 10 618 003  
Fax: +358 9 630 976  
Email: [carbonfinance@nefco.fi](mailto:carbonfinance@nefco.fi)

