

© Welcome to **ENVIMA**
Small Renewable Energy Systems



*Economic Solutions
for the Environment*



ENVIMA is an international organization, working on **Environmental Technology and Consulting Projects** in several countries and is represented in Germany, Colombia, Thailand and Indonesia

ENVIMA Setup



Since 1992 *ENVIMA* Germany

Associated with Rau Engineering GmbH
Associated with Perspectives GmbH

Since 2000 *ENVIMA* in Asia

ENVIMA (Thailand) Co. Ltd.
ENVIMA (Indonesia) Co., Ltd. (2006)
ENVIMA (Cambodia) Representative Office (2005)

Since 1999 *ENVIMA* in South America

Representative Office in Bogotá, Colombia
Associated with Consultores de Proyectos Ambientales Internacionales (CPAI Co. Ltda.)

ENVIMA implements projects in 17 countries



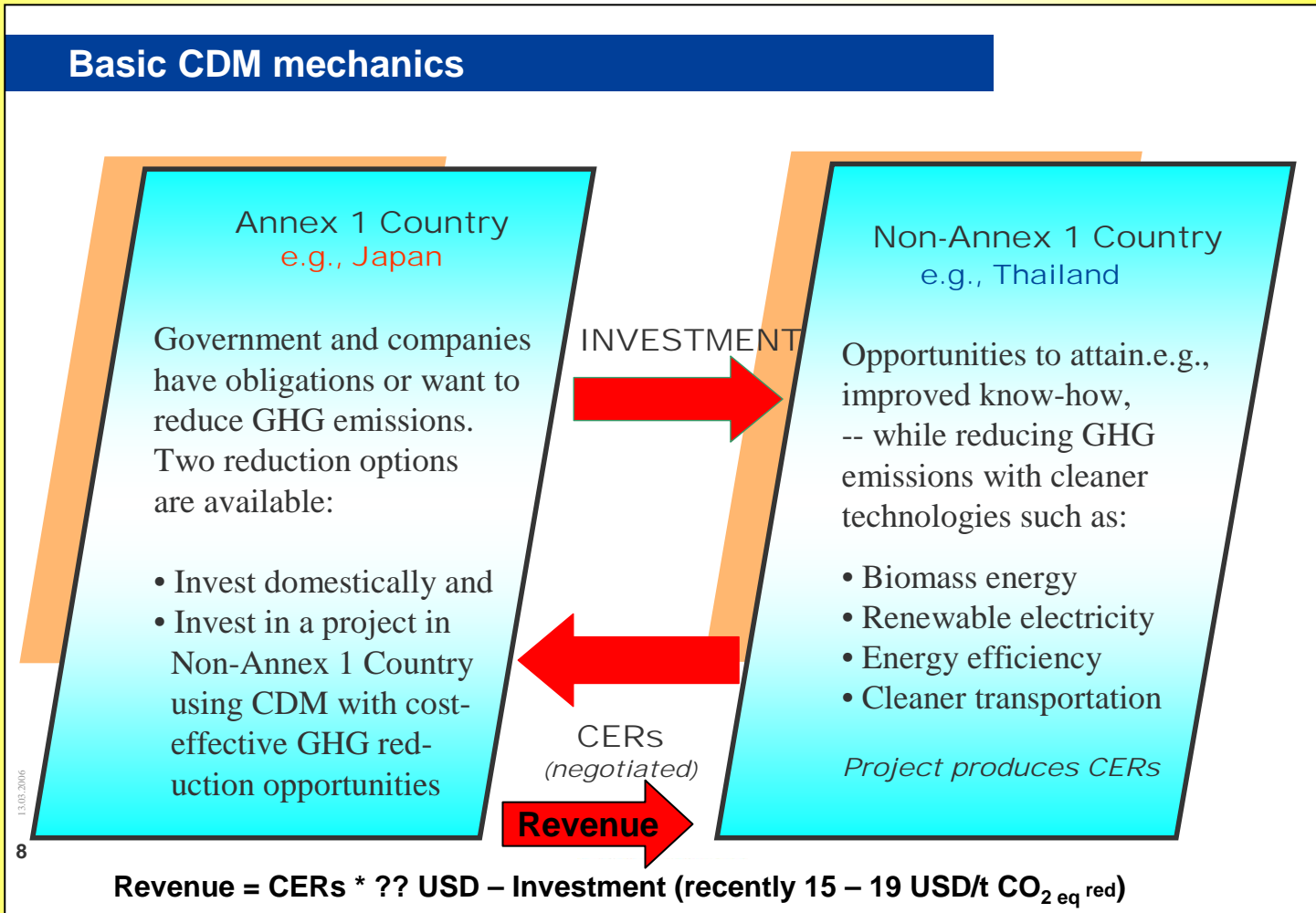


ENVIMA Portfolio

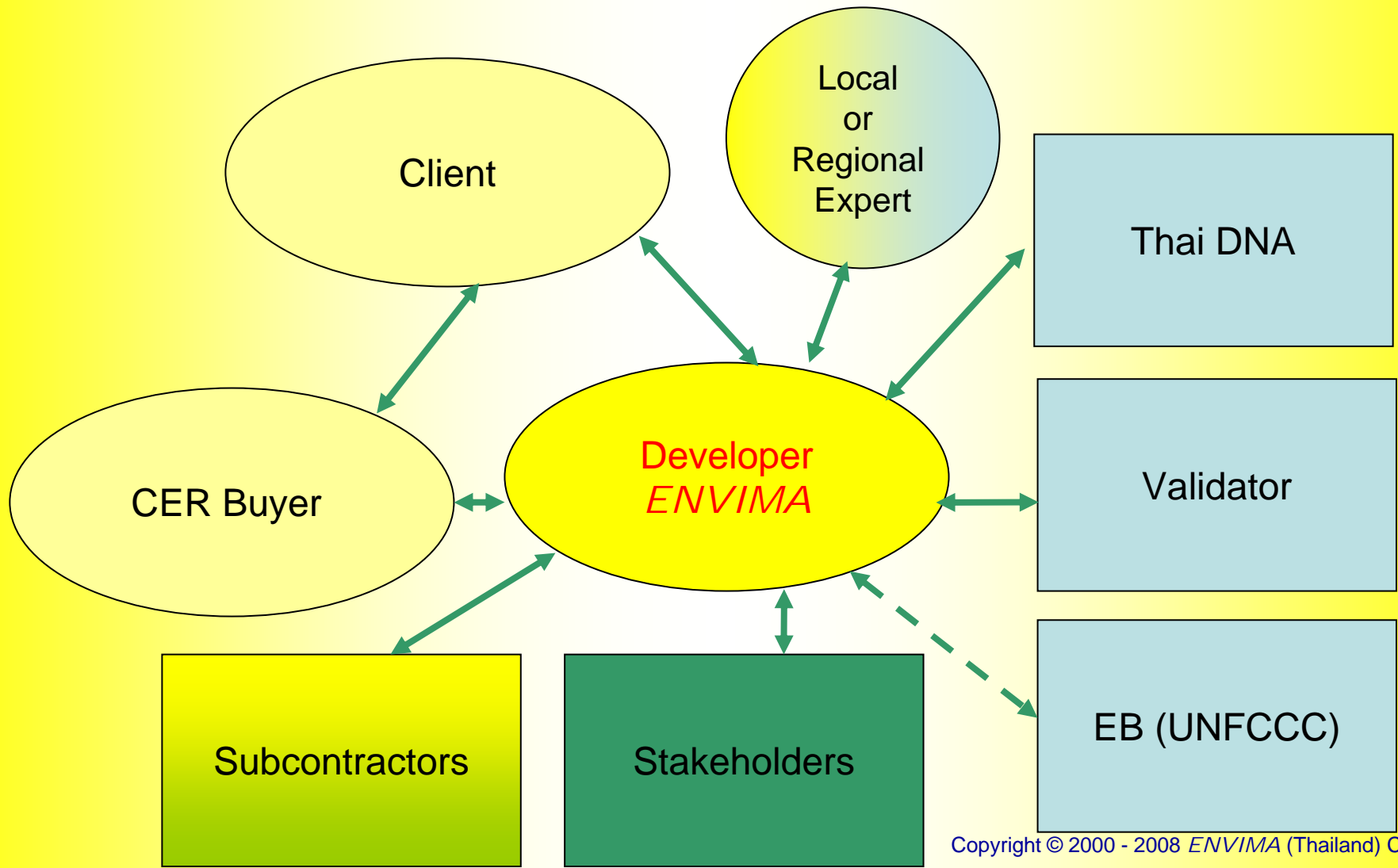
- Eco-Efficiency and Energy Efficiency Concepts
- Industrial Environmental Management
- Photovoltaic and Solar Thermal Systems
- Biomass, Biogas Systems
- Mini-Hydropower Systems
- CDM Services (Total Application Service on Gold Standard)
- Industrial Environmental Information and Accounting Systems
- National Environmental Management Concepts

***“CDM - economic incentive or financial
and managerial burden?”***

CDM Principle



Organization of CDM Projects under ENVIMA



The Clean Development Mechanism has a three-fold purpose:

- to contribute to sustainable development by encouraging introduction of **sustainable energy and clean technologies** in companies in less industrialised economies;
- to contribute to the absolute mitigation of greenhouse gas emissions;
- to enable industrialised countries to meet part of their GHG emission reduction commitments abroad in a cost-effective manner.

Potential for 'win-win' scenarios

- Appropriate projects will go conform with host country sustainability criteria
- Acceptable projects will allow investing (Annex 1) country to reach its UNFCCC GHG emission reduction targets
- Generation of a new revenue stream (called "certified emission reductions"), in addition to traditional project revenue stream and other project benefits

Revenue Flows of CDM Projects

CDM projects are comprised of two parallel revenue flows

First flow: Base projects, typical traditional project investment.

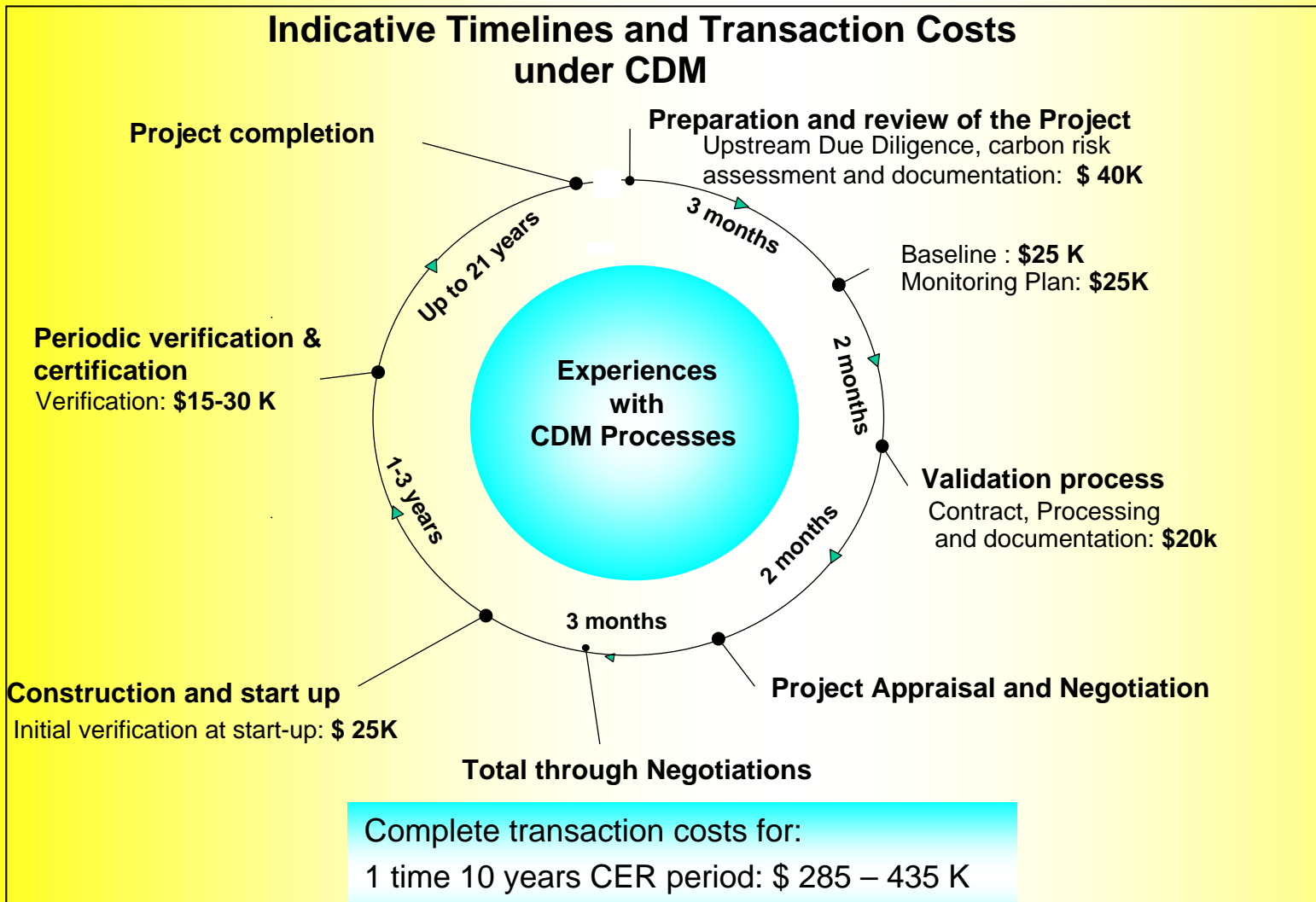
- Pre-feasibility, feasibility and development.
- manageable level of risk and an acceptable internal rate of return,
- investment is typically undertaken by multilateral banks, private commercial banks, specialised funds or a combination thereof with cost recovery and profit in mind.

Second flow: “carbon revenue flow.”

- Products: CERs according tonnes CO_{2eq} avoided or reduced
- Owner of CERs are all parties invested into the project by finance and labour (subject of negotiation between parties)
- CERs are subject of interest of buyers in Annex 1 countries. Recent market value of CERs 15 – 19 USD, for Gold Standard Projects more

Transaction Cost of CDM projects

Indicative Timelines and Transaction Costs under CDM



Additional Development and Project Operation Costs due to CDM

- Registration fees DNA and UNFCCC
- Personnel participation of the company
- Requirements on comprehension of feasibility study
- Comprehensive and international level monitoring requirements (equipment, QA/QC system)
- Cost of financing

Revenues from CDM projects

CDM Revenue is calculated as

Revenue from CERs – (CDM transaction + add. CDM related costs + costs of finance)

Example:

Transaction costs:	360,000 USD (Consultant, DOEs, Registration, crediting period 10 years)
Additional costs:	350,000 USD (Applicant's internal costs, incl. add. monitoring system)
Finance costs:	20,000 USD
Total	730,000 USD

Minimum 5,000 CERs of tCO₂ required to cover costs in 10 years operation at 15 USD/tCO₂)

Impact of CDM on Return on Equity

Weighted Average Costs of Capital:

$IRR = RoE * \text{equity/Total Capital} + \text{interest rate} * \text{debt/total capital}$

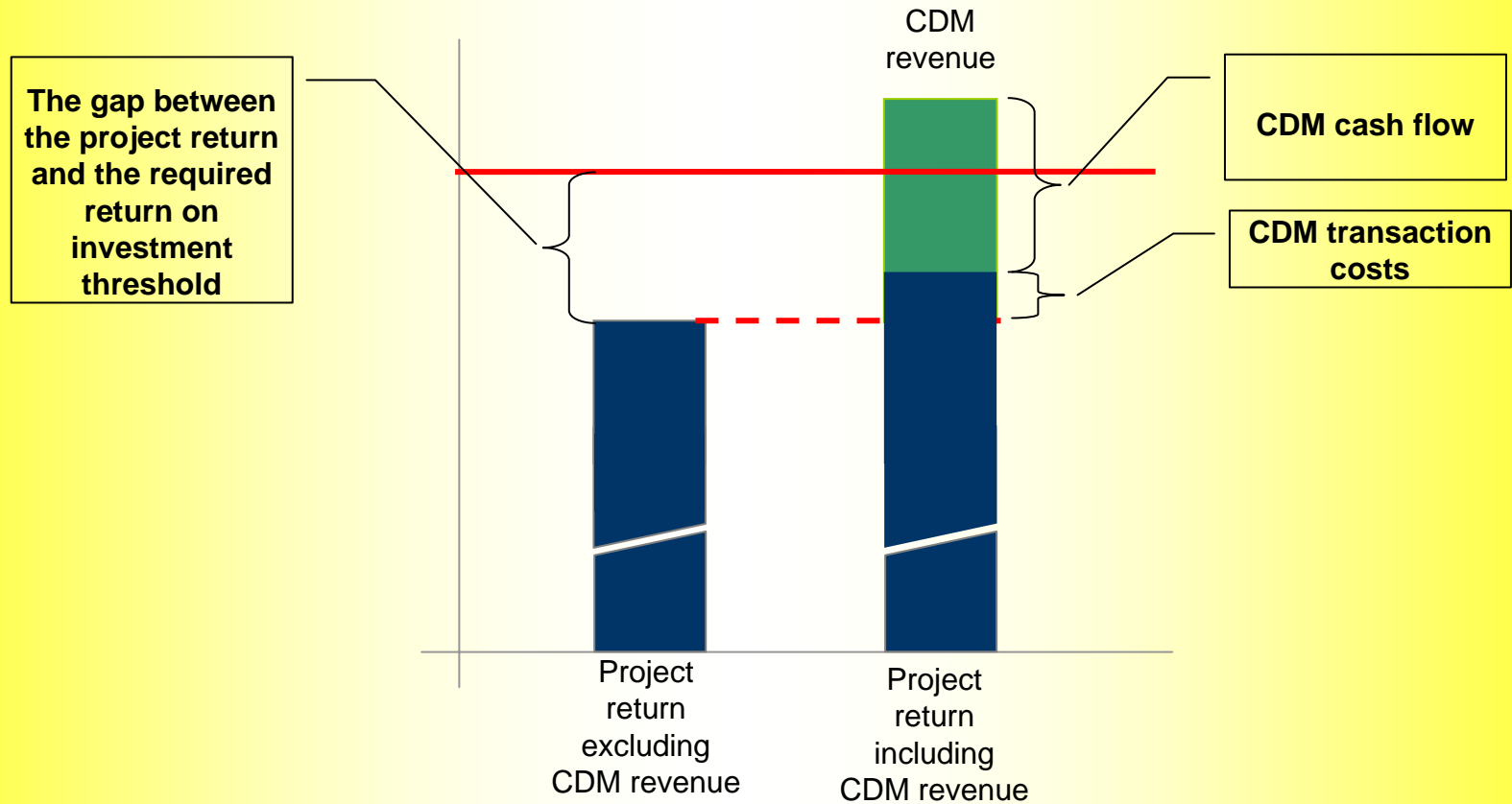
Example: **IRR w/o CDM** = 10%, interest rate is 7%, 50% Debt, 50% equity

=> Return on equity is: **13%**

Example: **IRR with CDM** = 12% (**+2%**), interest rate is 7%, 50% Debt, 50% equity

=> Return on equity is: **17% (+4%)**

Additional revenue flow from CDM



Required return on investment threshold ———

Summary of CDM Costs and Revenues
based on 5 CDM applications
in the last 2 years
in SEA

Project and CDM Investment and Revenues

Item No.	Cost position	External cost (US \$)	Internal cost (US \$)
1	Development of project idea and pre-screening	5,000	2,500
2	Estimate of environmental and social impacts (part of feasibility study)	Incl. in item 1	-
3	Elaboration of the Project Idea Note (PIN)	2,500	1,000
4	Negotiations and settlement of contract with partner company/CER broker/CER buyer		2,000
5	Elaboration of technical and economical feasibility study	25,000	8,000
6	Environmental and Social Impact Assessment (if required)	-	-
7	Elaboration of the Project Design Document	35,000	10,000
8	Detail design of the planned technology (considering consultant fee for bidding procedure, contracting with EPC contractor, design review and construction supervision – if applicable)	150,000	
9	Comprehensive Monitoring Plan	Incl. in item 7	1,000

Project and CDM Investment and Revenues

... cont'd

Item No.	Cost position	External cost (US \$)	Internal cost (US \$)
10	Stakeholder consultation process	3,500	700
11	Validation Process	30,000	500
12	Fees for document processing DNA host country and DNA Annex 1 country	600	
13	Processing fee at UNFCCC	4,100	
14	Detailed design of monitoring system	2,000	
15	Purchase and construction of the planned technology (including support through consultancy services – see item 8)	890,000	
16	Operation and Maintenance		130,000
17	Operation personnel		104,000
18	Purchase and installation of monitoring system	120,000	5,000

Project and CDM Investment and Revenues

... cont'd

Item No.	Cost position	External cost (US \$)	Internal cost (US \$)
19	Initial verification	20,000	1,000
20	Improvement of monitoring operation and management	5,000	500
21	Regular internal monitoring		60,000
22	Periodic verification and certification	45,000	2,500
23	Investment cost (interests @ 8 %/a)	50,000	
24	Total cost	1,387,700	328,700
25	Annual revenue from project (savings, sales of electricity and byproducts)	190,000	
26	Annual revenue from CER sales (@ 7 US \$ / tCO _{2eq})	210,000	
27	Simplified Payback Period (with CDM)	4.28 years	
28	Simplified Payback Period (without CDM)	9.01 years	

CDM Dilemmas with Impact on Revenues

- **Additionality versus IRR of economic RE-Projects**
- **Expectations of Applicants on Foreign Investment and Financial Risk Cover**

Additionality versus IRR of economic RE-Projects

- Local and international Banks and Funds as Co-Investors request high IRR for Investment
- CDM promotes financially additional projects, but also if they are technically additional and thus barriers and risk are coming along
- Project applicants try first to secure finances before contacting CDM Consultants

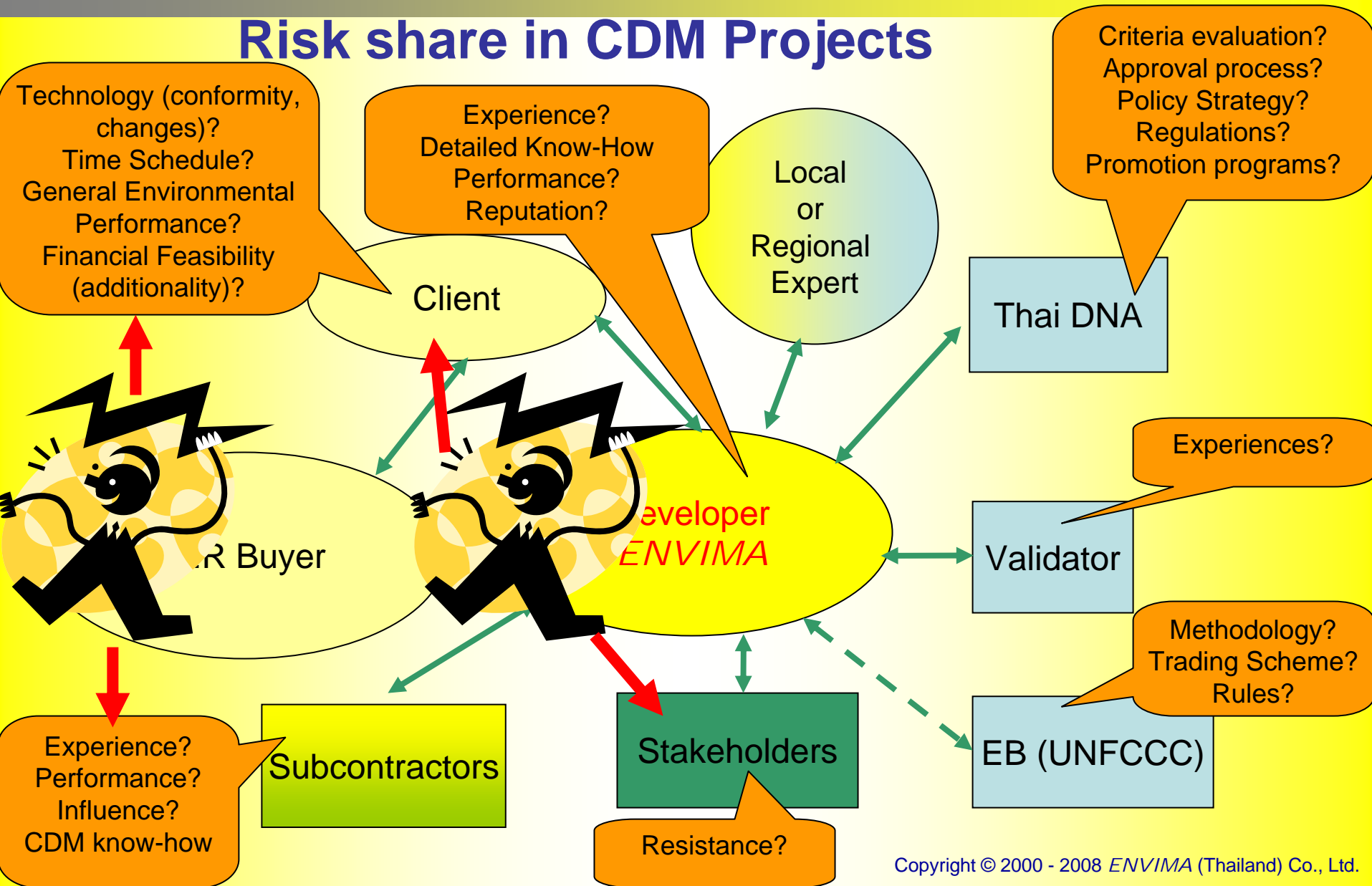
Solution:

- Technical and financial feasibility of each project should prove CDM feasibility first and integrate CDM in technical and financial feasibility study for loan requests
- CDM Consultant can provide technical advisory to match better to approved methodologies in order to identify the additionality

Expectations of Applicants on Foreign Investment and Risk Reduction

- Mainly pre-finance of transaction costs are expected
- Pre-finance comes along with 1 – 4 Euro less per CER
- Total losses can easily account to 10 times more than self-investment on transaction costs
- Risk Assessment indicates risk origin and risk minimizing potential without financial losses

Risk share in CDM Projects



Thank You

