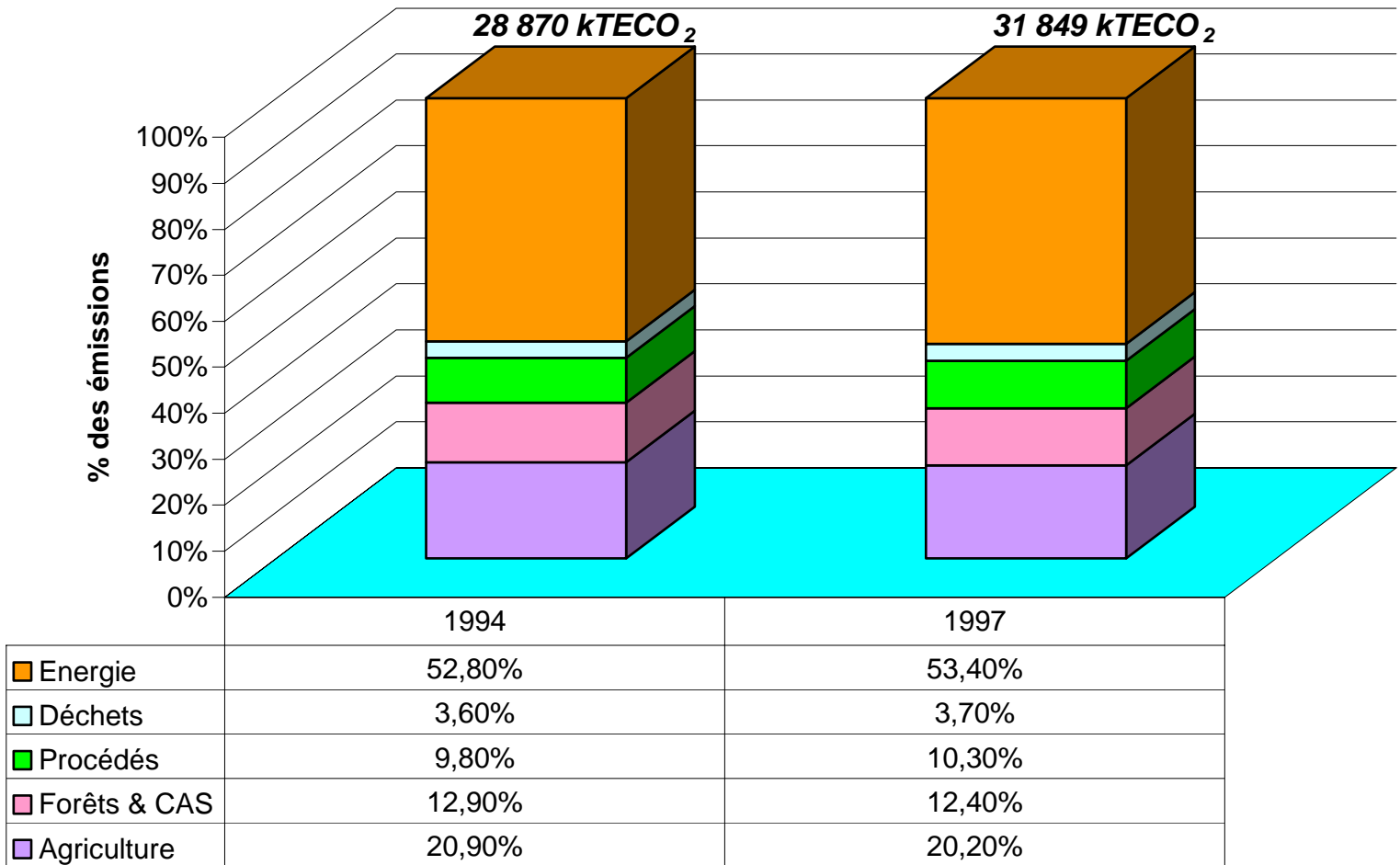


# CDM Small Scale Projects portfolio in Tunisia

*Workshop 18-19 & 20 march 2004*

## GHG emissions in Tunisia (1994 & 1997)



## Potential GHG mitigation in Tunisia

- ↪ 47 GHG mitigation options
- ↪ Total potential of 240 MTECO<sub>2</sub> (2002-2020)

Sectors	Number of options	2010	2020	2002-2020	%
Energy	33	7.8	13.4	145	60%
Agriculture	4	—	1.8	18	8%
Forest	6	0.7	3.6	50	21%
Waste	4	1.6	2.2	27	11%
<b>TOTAL</b>	<b>47</b>	<b>10.1</b>	<b>21.0</b>	<b>240</b>	<b>100%</b>

## Justification of CDM Small Projects for Tunisia

- ↪ Small projects fit well with characteristics of the Tunisian economy
  - ↪ Mainly composed with small and medium enterprises
  - ↪ Limited investment capacity of the local economic actors
- ↪ More than 60% of the mitigation potential in Tunisia can be met with small scale projects
- ↪ Procedures for implementing CDM small scale projects are relatively easy : fits with local actors implementing capacity

## CDM Small Scale Projects Portfolio

- ↻ Study leaded by UNDP and ANER
- ↻ Primitive identification of 10 CDM Small Scale Projects

Type of activities	N. of projects	Sector
Renewable energy	6	Electricity production : 4 Residential : 1 Tertiary sector : 1
Supply side energy efficiency	2	Electricity production: 2
Demand side energy efficiency	1	Tertiary sector : 1
Energy substitution	1	Transport : 1

## CDM Small Scale Projects Portfolio: Projects

- ↪ 2 wind energy projects
- ↪ 1 project of electricity generation from landfill
- ↪ 1 project of electricity generation from industrial organic waste
- ↪ 2 solar water heaters diffusion
- ↪ 2 cogeneration projects in industry
- ↪ 1 project of LNG use in public transport

## CDM Small Scale Projects Portfolio

### Project 1: Wind energy in the site of Metline

<b>Project Description :</b> Wind farm project in the governorate of Bizerte in the north of Tunisia	
<b>Capacity:</b> 14,45 MW (17 turbines 850 kW)	<b>Electricity production:</b> 44 GWh per year
<b>Wind Quality:</b> 3050 hours per year	
<b>Saved energy:</b> 11,5 kteo	<b>Saved energy on the period (20 years):</b> 230 kteo
<b>Emissions reduction:</b> 27 kTECO <sub>2</sub>	<b>Emissions reduction on the period (20 years):</b> 536 kTECO <sub>2</sub>
<b>Project cost:</b> 15 MUSD <b>CDM revenue on the period :</b> 2,7 MUSD; <b>18%</b> of the initial investment.	

## CDM Small Scale Projects Portfolio

### Project 2: Wind energy in the site of Talah

<b>Project Description :</b> Wind Farm project in the governorate of Kasserine in the Central West	
<b>Capacity:</b> 14,45 MW (17 turbines 850 kW)	<b>Electricity production:</b> 48 GWh per year
<b>Wind Quality:</b> 3300 hours per year	
<b>Saved energy:</b> 13,8 kteo	<b>Saved energy on the period (20 years):</b> 276 kteo
<b>Emissions reduction:</b> 32 kTECO <sub>2</sub>	<b>Emissions reduction on the period (20 years):</b> 640 kTECO <sub>2</sub>
<b>Project cost:</b> 15 MUSD	
<b>CDM revenue on the period :</b> 3,2 MUSD; <b>21%</b> of the initial investment.	



## CDM Small Scale Projects Portfolio

### Project 3: Landfill valorization: Electricity generation

<b>Project Description :</b> Landfill of Djebel Chakir open on 1997 -700 t of Waste per year (40% of national waste production); 68% of organic waste	
<b>Electricity production:</b> 94 GWh per year	
<b>Saved energy:</b> 24 kteo	<b>Saved energy during the period (10 years):</b> 240 kteo
<b>Emissions reduction:</b> 56 kTECO <sub>2</sub>	<b>Emissions reduction during the period (10 years):</b> 560 kTECO <sub>2</sub>
<b>Investment cost:</b> about 12 MUSD <b>CDM revenue on the period :</b> 2,8 MUSD; <b>25%</b> of the initial investment.	

## CDM Small Scale Projects Portfolio

### Project 4: Water Solar Heaters in residential sector

<b>Project Description :</b> - 10.000 householders within 3 years - 25.000 m2 of solar captors	
<b>Saved energy:</b> 2,8 kteo per year	<b>Saved energy during the period (10 years):</b> 28 kteo
<b>Emissions reduction:</b> 6,5 kTECO <sub>2</sub>	<b>Emissions reduction during the period (10 years):</b> 65 kTECO <sub>2</sub>
<b>Investment cost:</b> about 12 MUSD <b>CDM revenue on the period :</b> 3,2 MUSD; <b>27%</b> of the initial investment.	

## CDM Small Scale Projects Portfolio

### Project 5: Water Solar Heaters in hostel sector

#### Project Description :

- hostels of a total capacity of 30000 beds within 3 years
- 27.000 m2 of solar captors

**Saved energy:** 3 kteo per year

**Saved energy during the period (10 years):** 30 kteo

**Emissions reduction:** 7,5 kTECO<sub>2</sub>

**Emissions reduction during the period (10 years):** 75 kTECO<sub>2</sub>

**Investment cost:** about 12 MUSD

**CDM revenue on the period :** 3,8 MUSD; **30%** of the initial investment.

## CDM Small Scale Projects Portfolio

### Project 6: Energy efficiency in public lighting sector

**Project Description :**

- Substitution of 40.000 conventional bulbs by sodium bulbs in 3 big districts (Goulette, Ariana, Mourouj). The national potential is about 410.000 bulbs.
- Installation of 90 voltage regulators

**Saved energy:** 3,6 kteo per year

**Saved energy during the period (10 years):** 10,8 kteo

**Emissions reduction:** 8,4 kTECO<sub>2</sub>

**Emissions reduction during the period (10 years):** 25,3 kTECO<sub>2</sub>

**Investment cost:** about 2,2 MUSD

**CDM revenue on the period :** 0,126 MUSD; 6% of the initial investment.

## CDM Small Scale Projects Portfolio

### Project 7: LNG use in public transport

**Project Description :**

Include 100 LNG bus in the park of the urban national transport company in Tunis

**Gas oil substituted:** 6 kteo per year

**Substituted gas oil during the period (10 years):** 60 kteo

**Emissions reduction:** 3 kTECO<sub>2</sub> per year

**Emissions reduction during the period (10 years):** 30 kTECO<sub>2</sub>

**Investment cost:** about 12 MUSD

**CDM revenue on the period :** 0,15 MUSD; **1,3%** of the initial investment.

## CDM Small Scale Projects Portfolio

Projects	CDM revenue/Investment
Wind Energy	18% to 20%
Landfill	25%
Solar heater	28% to 30%
Cogeneration	24% to 27%
Public lighting	6%
LNG use in transport	2%