

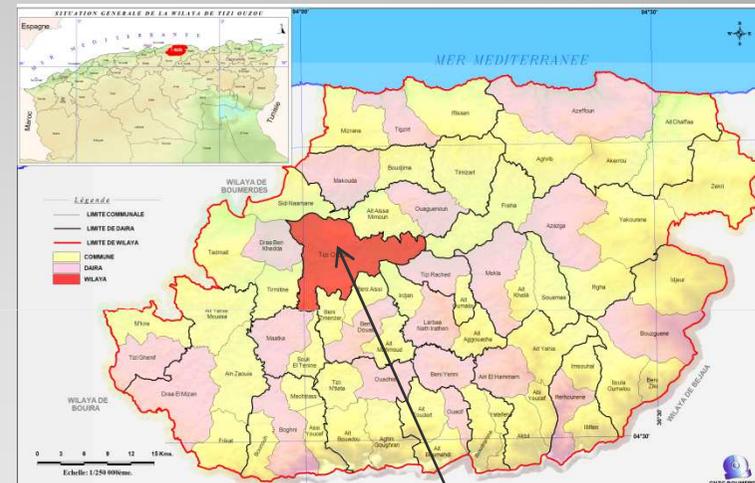


# New waste-to-energy plant in Tizi Ouzou, Algeria

20<sup>th</sup> September 2013  
Torino, Italy

Anzhela Arakelyan (Armenia)  
Alexandra Avdonina (Russia)  
Irakli Chanturidze (Georgia)  
Djamila Rahmouni (Algeria)  
Alena Sharaburka (Belarus)  
Antonio Stanziola (Italy)

# Introduction



Regional body of the city

## National context

The national objectives of the environmental strategy are:

- Improve the health
- Preserve natural capital and improve productivity
- Reduce economic losses and recycling of waste
- Protect the global environment.

In 2002 Algeria has developed a National Action Plan for Environment and Sustainable Development, two programs are implemented: PROGDEM and PNAGDES

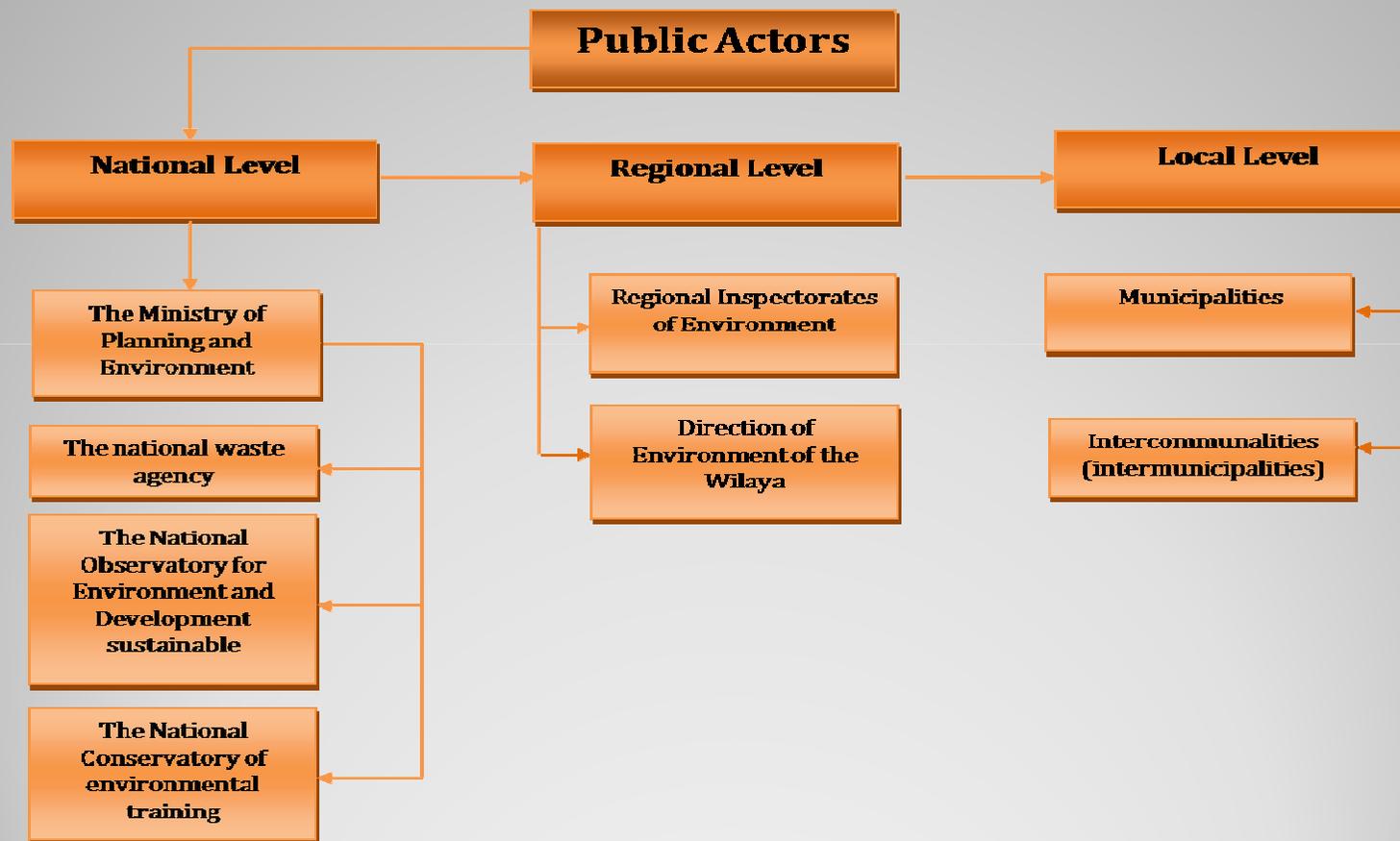
# Legal framework of waste

- Decree n° 84-378 of 15 December 1984 laying down the conditions of cleaning, processing of municipal solid waste. Several texts have succeeded, the most recent are:
- 2001: implementation of the law on the management, control and disposal of waste, which empowers municipalities in terms of removal and disposal of waste;
- 2002 : the decree that empowers holders for removal and recovery of their waste, and clarifies the possibility of use of approved companies or public system recovery, recycling and recovery of waste
- - In 2004: decree organizing the public system by introducing the name "Eco-Jem," and it specifies the terms of its creation, operation and financing
- - In 2006: classification of waste
- - In 2009: Decree regulating the activity of waste collection

# Waste financing

- Financing on the municipal budget
- Tax garbage collection (Taxe d'enlèvement des ordures ménagères TEQM)
- Environmental Taxation: with an incentive framework for clearance and are specific taxes on fuel tax, tax on plastic bags, tax incentives care activities ...etc.
- Fines run during non-compliance with regulations, the amount depends on the offense

# Regulation and framework of the sector



## Local context

### Indicators of the wilaya:

- The area of Tizi Ouzou is 2 957.93 km<sup>2</sup>
- The number of population in Tizi Ouzou is 1 158 684 inhabitants
- The quantity of the waste in the city is 289 646 tons/year
- Controlled discharge: 33
- Non controlled discharges: 1250
- Volume of waste generated: 829.82 tons / day
- Volume of waste treated: 591.5 tons / day

# Description of the project

## Objectives

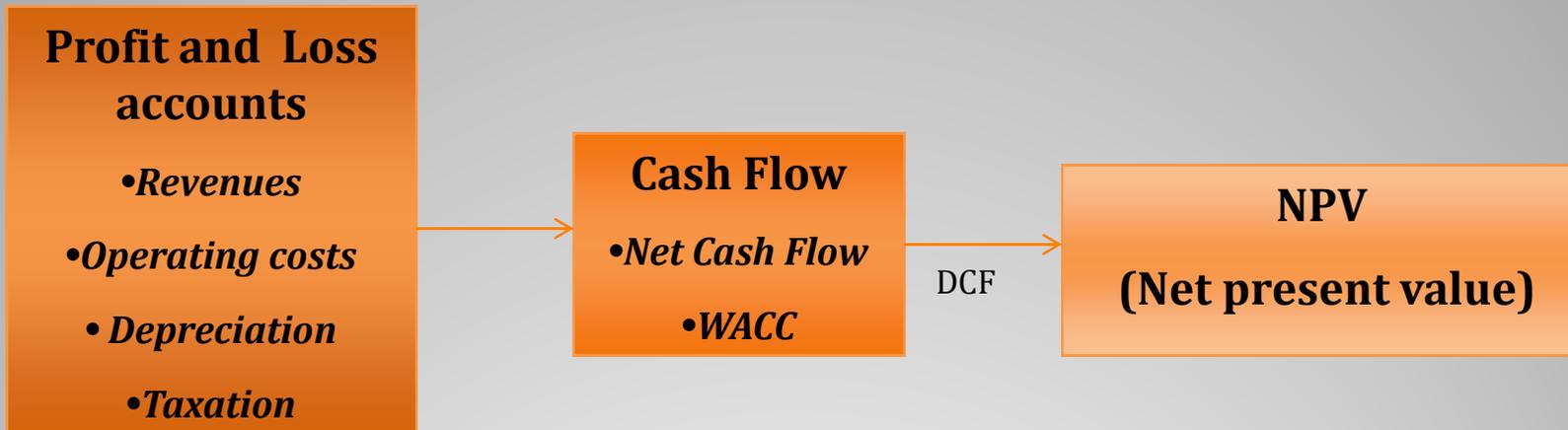
- To get more revenues from oil and gas sold abroad, by using of energy received from the waste at the place
- To have cleaner environment through an improvement of its solid waste management and practices

## Who

“IAADAA & B” CJCS Company (Public-Private Partnership -PPP) which is

- 70% Public (government, municipalities )
- 30% Private

# Methodology



**Discounted Cash Flow Methodology**

**NPV > 0, project is profitable**

# Tariff

Waste tariffs, for each year, will be computed following the next three steps

1. compute total operating costs and total investment;
2. compute total revenues from waste disposal as difference between total cost (total operating cost + investment) and revenues from sale of energy;
3. Compute discount revenues from waste disposal and divide them by the total amount of processed waste.

In order to avoid high variation in the tariffs the local authority can decide to set tariffs taking an overall average over the 20-year period of the life of the incinerator plant. Therefore, the tariff set is **7,768 Da per tons (about 8 Da per Kg)**.

# Environmental impact assessment



- No landfills: we save the lands
- No waste: we remove 902 tons of waste per each day
- No Greenhouse Gas emissions and No climate changes: we have 20% less CO<sub>2</sub>/kWh than a Combined Cycle Gas Power plant and 60% less CO<sub>2</sub>/kWh than a Coal Plant

# Conclusions

- **Revolutionary project for Algeria:**
  - produce electricity from waste and
  - save natural resources (oil and gas) to sell them into more profitable outside markets;
- **Average waste tariff is about 7,768 Da/tons**

## Main caveat

- **Comparison with the actual regulatory framework is not easy. Waste management is financed by general taxation.**
- **Availability of data, in particular:**
  - data related to the cost of equity (real rate of equity return of Algerian banks)
  - data related to the cost of debts (rate of new external debts in Algeria).
  -
- **Tariff set according to the only the cost-recovery method. Other mechanism (e.g. incentive regulation, price cap, rate of return) should be considered.**