WATERLOSS EUROPE 2017 – 6-7 SEPTEMBER 2017 - COPENHAGEN

FINANCING WATER LOSS MANAGEMENT : FINANCING SCHEMES

DIDIER CARRON (NALDEO, FRANCE)

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NALDEO

- NALDEO is a French **engineering and consulting firm specialized in Water, Waste management and Renewable Energy**
- Net sales 17 M€, 190 experts, ISO 9001 / HSE certified

- **Experience and innovative tools in :**
  - PPPs
  - Non Revenue Water (NRW)
  - Performance based contracts
  - Creation of new public operation bodies (corporations)
  - Asset management
  - Smart networks – smart metering
  - Energy efficiency

- Naldeo is active member of IWA – D. Carron vice-chairman of the Performance Based Contract (PBC) task group
- Naldeo has been gold sponsor of IWA in 2013 and 2014, based on its work on performance based PPP contracts

NON-REVENUE WATER : A MONEY MAKING PROJECT ?

- PPIAF June 2016 : The fact that NRW-reduction programs can "pay for themselves" has allowed an increasing number of water-service providers to engage specialized private-sector contractors in performance-based contracts (PBCs) for NRW management,

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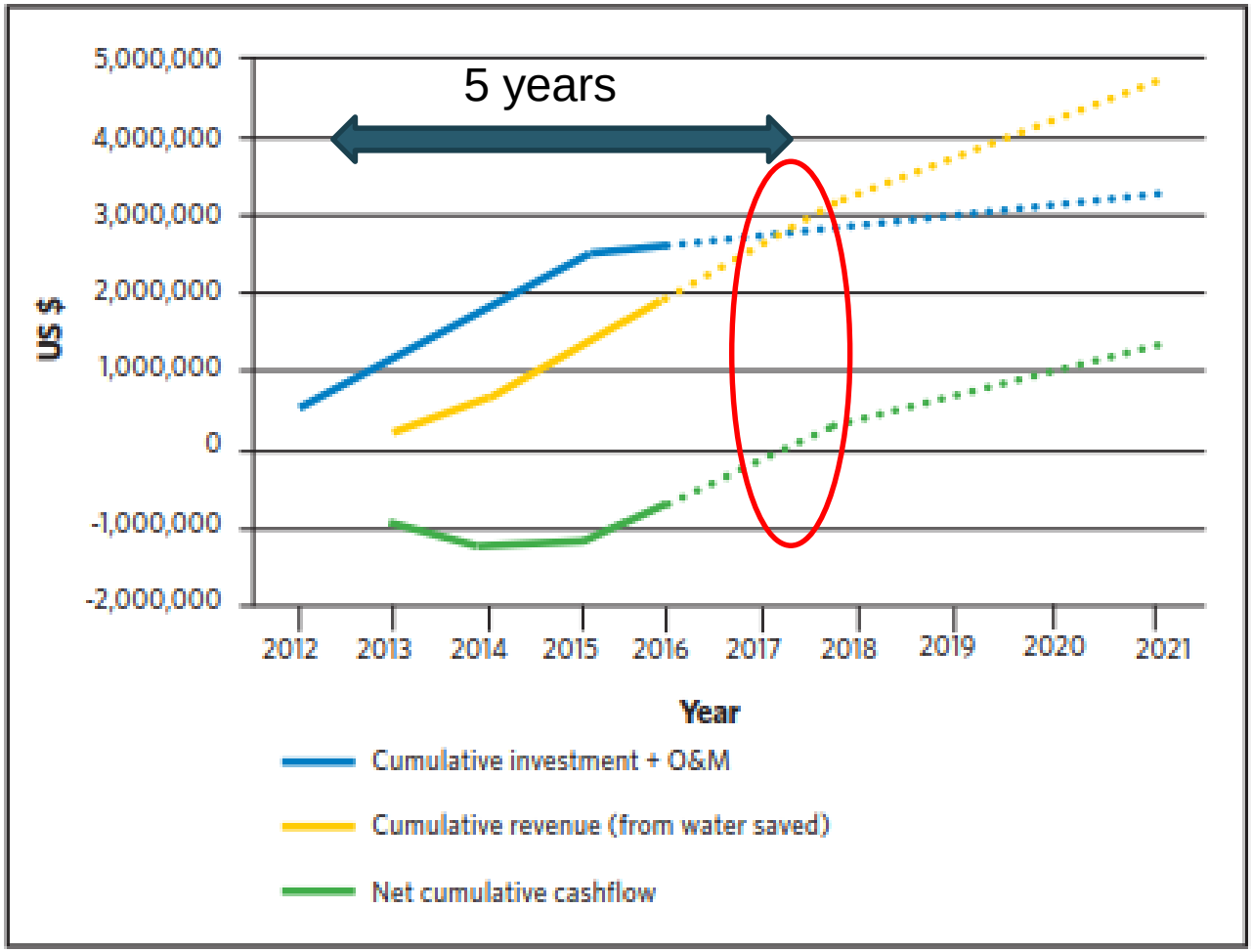
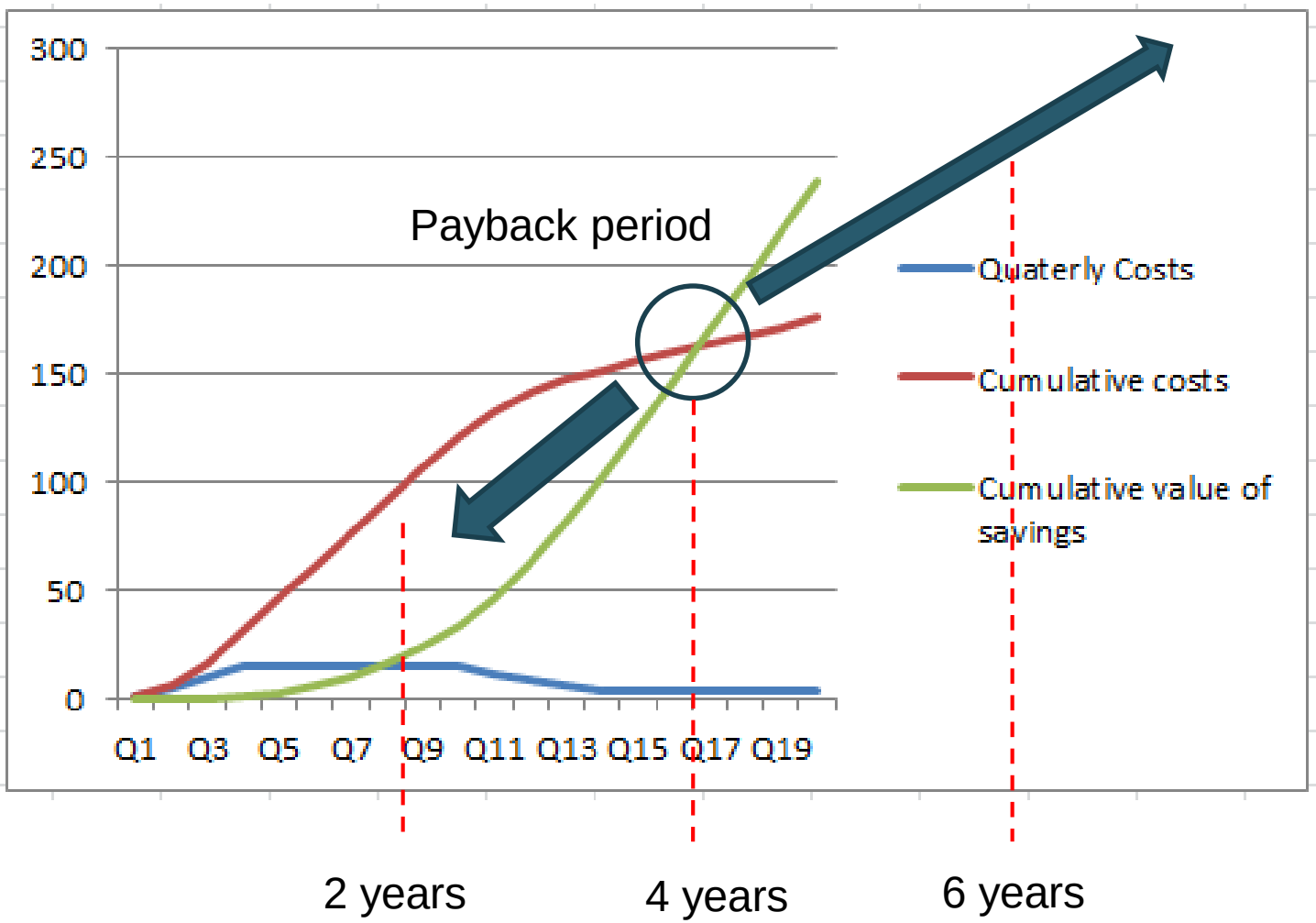
PAY BACK PERIOD – CASE STUDY - JIRIMA CASE (MADAGASCAR) – INTERNAL PROGRAM



PAY BACK PERIOD : UNCERTAINTIES



PAY BACK PERIOD EXISTS BUT IS QUITE UNCERTAIN WHEN IT OCCURS

- Payback period exists but :
  - depends on the nature of NRW and of solutions selected to reduce losses
    - Quite often the baseline remains very uncertain, with 1) potentially higher apparent losses than expected and 2) type of apparent losses difficult to evaluate
  - can take many years
  - is very uncertain due to high sensitivity of many factors : physical, institutional, political, etc

- Even the impact of a set of actions is quite tricky to predict between :
  - The “low hanging fruits” / the quick wins
  - The time needed to get substantial results from long term policies
  - Interactions during implementation of actions

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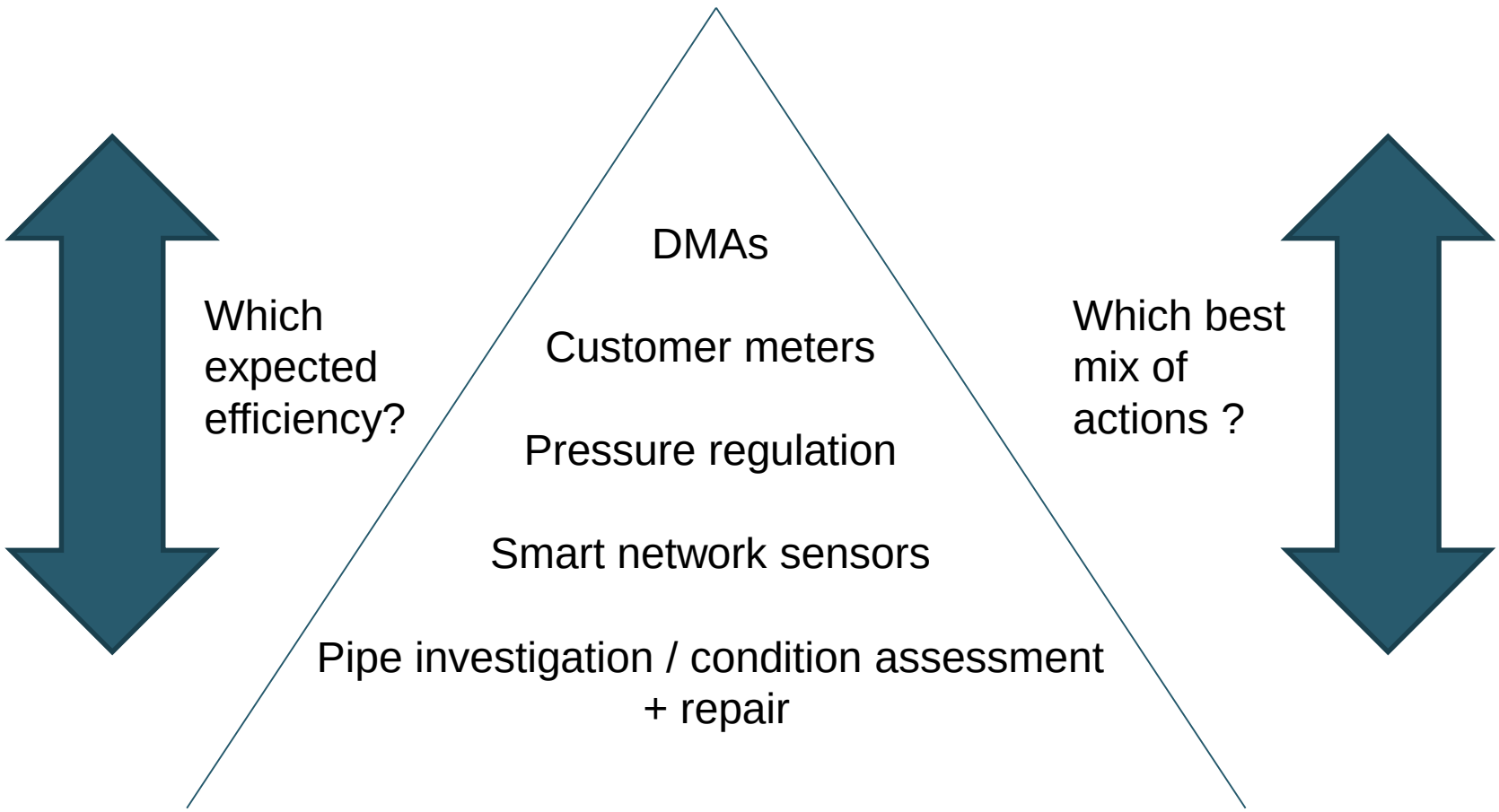
PAY BACK PERIOD : DEPENDS A LOT ON THE CASE

NRW	Features	Impact when reducing	Invest ment ?	Payback
Physical losses	24/7	Less production and capital costs (ELL)	Yes	
	< 24/7	More revenue	Yes	
Apparent losses	Meter replacement	More revenue	Yes	
	Unread meter / non billed meters / illegal connections	More revenue	Little	

NRW PROGRAMS ARE NOT EASY TO BEST ESTABLISH



THE GREATER LYON NRW CHALLENGE (1/3)

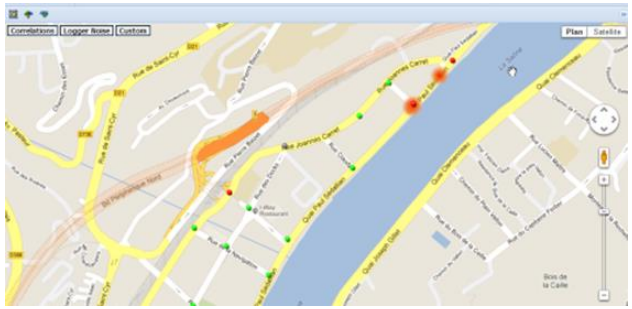
- Greater Lyon : population 1,3 million
- New operation contract (operation by a private contractor) starting early 2015
- Rather complex network
  - Irregular topography
  - Meshed network
- Greater Lyon : NRW 22 %
- Target : reduce NRW down to 15 % in less than 2 years (end of 2016)
- DMAs ???

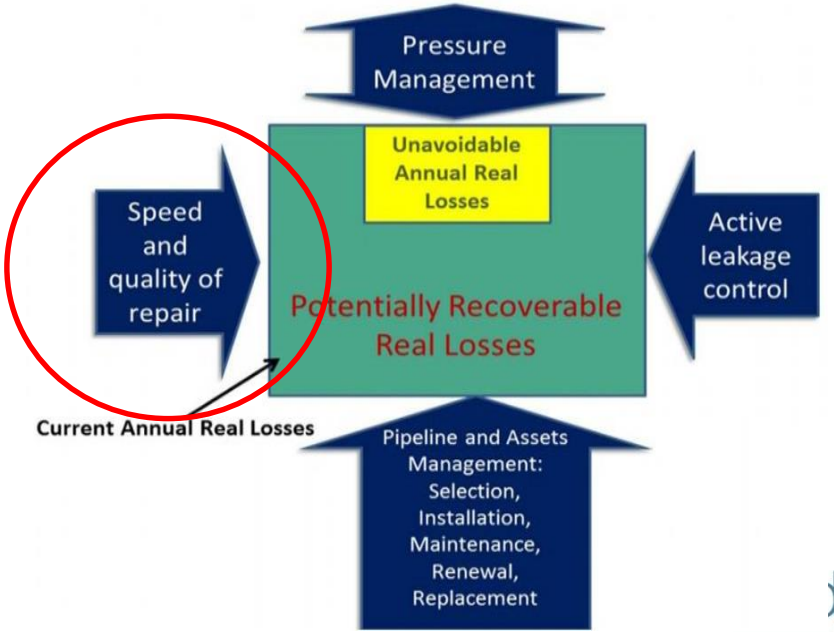
Greater Lyon

THE GREATER LYON NRW CHALLENGE (2/3)

- Proposal by the contractor
  - 61 actions
  - Including installing 5500 fixed sensors over 1400 km of the distribution network

- The selected sensors make is possible to calculate every night correlations between all neighboring sensors pairs and detects anomalies. Every morning, the leakage managers can then investigate all new leak indications online, which are pinpointed.





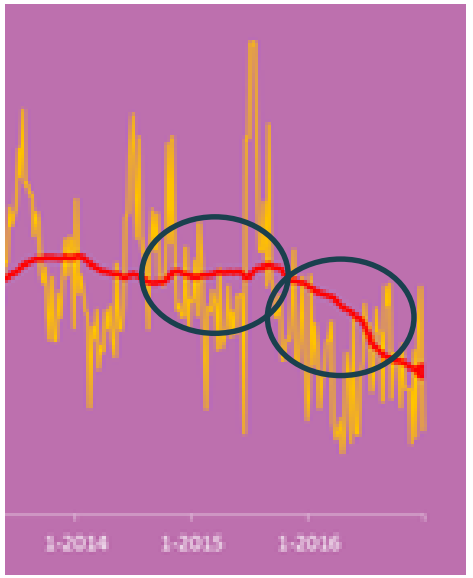
THE GREATER LYON NRW CHALLENGE (3/3)

- Results : night flows
  - in 2015 : average night flow 4 720 m3/h
  - in 2016 : average night flow 4 088 m3/h

- As a result of the 61 actions, including the fixed sensors which played a major role, NRW has been reduced from 22 % to 15 % in 1,5 years.
- Pay back period < 6 years

- **Conclusion : New approaches / new options, such as smart networks, and integrated plans have to be considered in "competition" with more conventional or focused approaches … but their effectiveness are even more difficult to predict**

Source : Gutermann web site

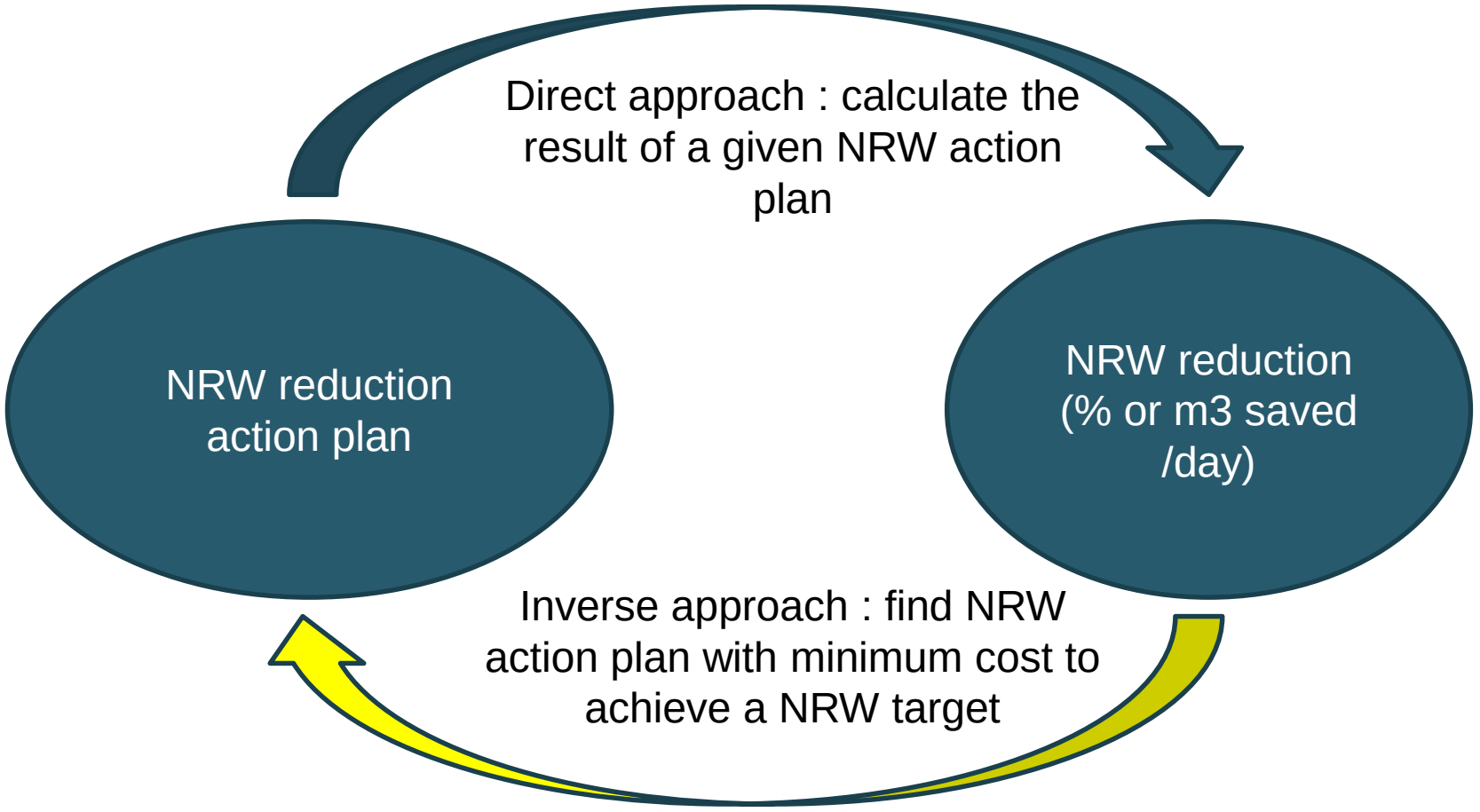


Source : Veolia

BUT MORE GENERALLY, NRW REDUCTION PROGRAMS ARE A MIX OF ACTIONS, ESPECIALLY IF LONG TERM

- The inverse approach aims at calculating the best (ie the most cost effective) mix of action to achieve a NRW level in a sustainable way., and providing its prospective cost.

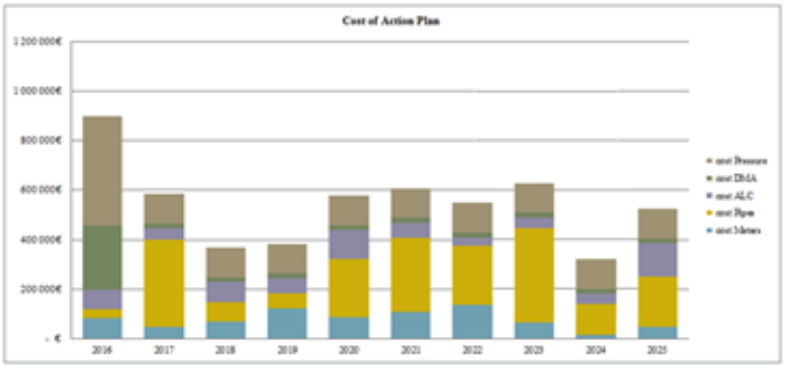
THE INVERSE APPROACH (1/2)

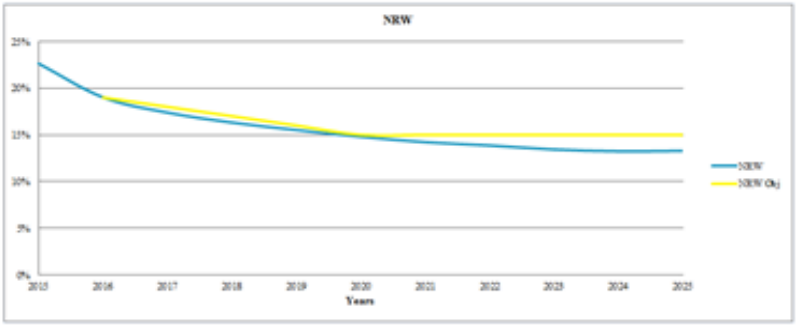


THE INVERSE APPROACH – CASE STUDY (2/2)

Action plan designed by an expert

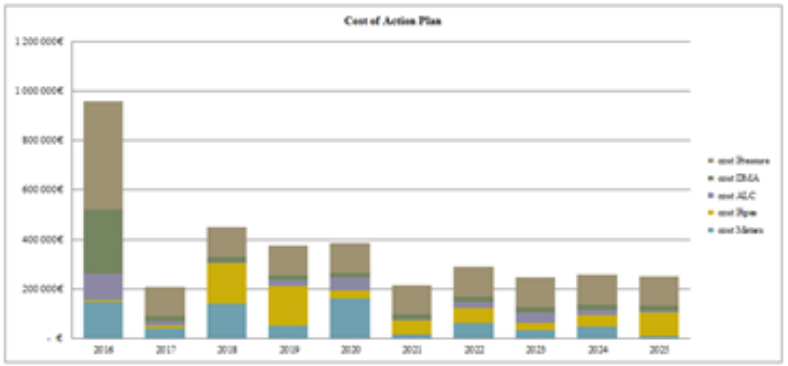
Cost 4 796 610 €

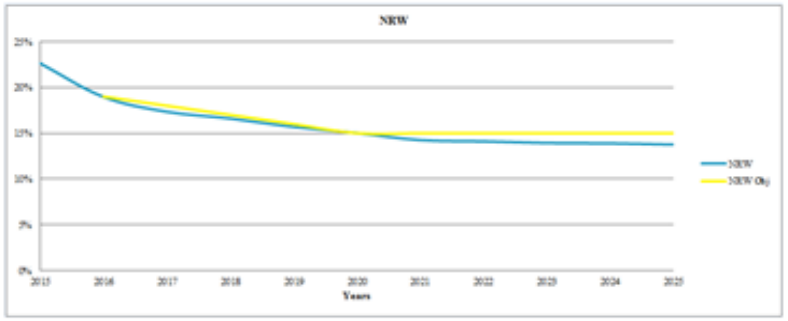




Action plan found after optimization

Cost 3 336 239 €





Both action plans lead a to a NRW of 15 % after 5 years

THE INVERSE APPROACH - CONCLUSIONS

- **Using the inverse approach makes it possible :**

- To get a comprehensive and long term view on NRW and select an optimal reachable and financially sustainable action plan.
- To “do more with less” : smart investment
- To provide a tool to :
  - The Operators, who can use this approach in order to select a NRW policy
  - The Contractors, who can use this approach to establish their proposal for NRW reduction
  - The Regulators, who can get a long term view on water supply capacities and possible development of level of service
  - The Financials and the Water Public Authorities, who can relate operational targets and financial resource, and thus fix a financial plan to support NRW reduction and select

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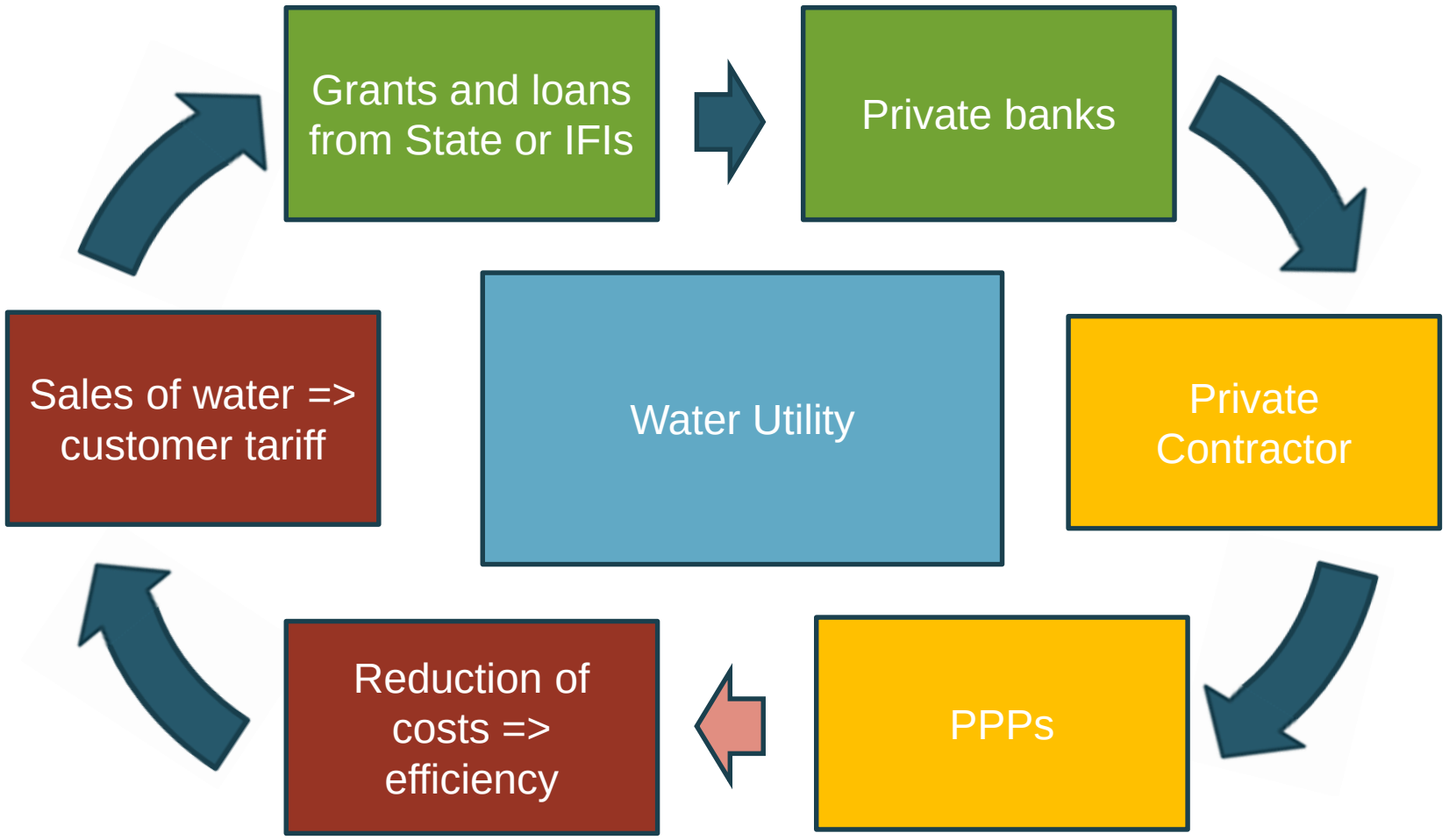
BEFORE CONSIDERING FINANCING

- So the difficulty of financing NRW reduction projects may be less in the financing itself than :
  - Evaluating the need and the appropriate actions
  - Evaluation their cost
  - Evaluating the financial return (pay back period)
  - Evaluating the risks in order to mitigate them as much as possible

FUNDING


Grants and loans from State or IFIs
Private banks
Private Contractor
PPPs
Reduction of costs => efficiency
Sales of water => customer tariff
Water Utility

BEFORE CONSIDERING EXTERNAL FUNDING

- 1) Tariff – Recovery of all costs is a must
  - Use of price bands in order to however supply the first m3 at a low price
  - When not 24/7, the hypocrisy of public low tariffs (as the poorest will pay much higher from the water market)

- 2) Improve efficiency
  - Billing efficiency
  - Collection efficiency
  - Reduction of costs
  - => increasing cash flows

- 2 comments :
  - This is valid as well in developing countries as in developed countries
  - Even if not the case, there will be requirements on financial sustainability of a Utility which would look for external financing

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ACCESS TO PRIVATE FINANCING BY UTILITIES

- Because NRW program can pay for themselves, Utilities “should” be able to attract loans from public and also private banks for NRW reduction projects.

- Currently developing mechanisms for creditworthiness ease the access by Utilities to private sector finance to supplement public/donor sources

- Creditworthyness is also a way to more efficiency and sustainability
  - Full recovery of the costs by the revenues sources
  - integrated business plan including a capital plan, the capital costs, the annual debt service costs, the cash flows, and the operational cost impact of investments
  - Risk management, including institutional risks

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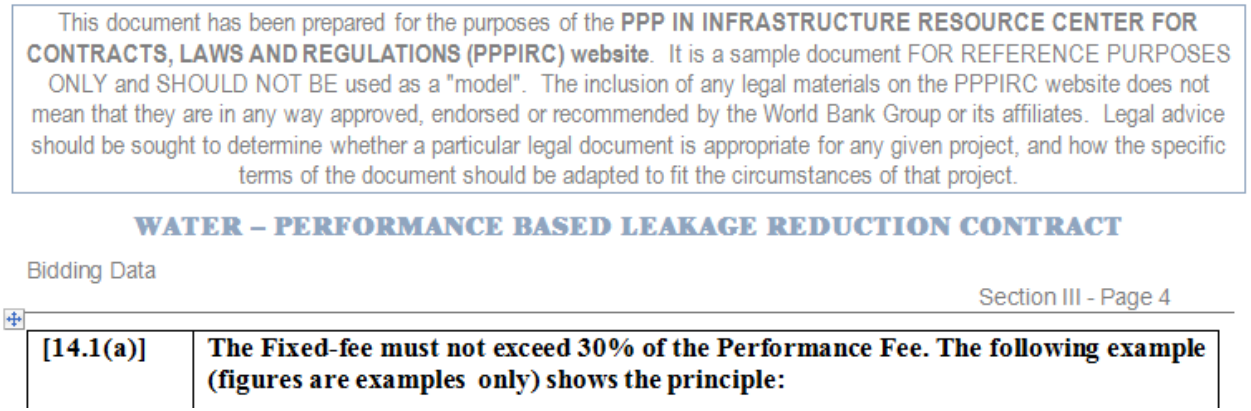
PRIVATE FINANCING MIGHT INCREASE IN THE FUTURE (1/2)

- Typical NRW Performance based contract (PBC) already target to hold the fixed fee component of the performance fee quite low, for example below 30 %:



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WATER – PERFORMANCE BASED LEAKAGE REDUCTION CONTRACT

Bidding Data

Section III - Page 4

[14.1(a)]	**The Fixed-fee must not exceed 30% of the Performance Fee. The following example (figures are examples only) shows the principle:**

- One could think of “fully variable fee” PBCs = fully market driven PBCs

PRIVATE FINANCING MIGHT INCREASE IN THE FUTURE (2/2)

- However to achieve “fully market driven” PBC, there is the need for mitigating the risks for the private contractor as much as possible.

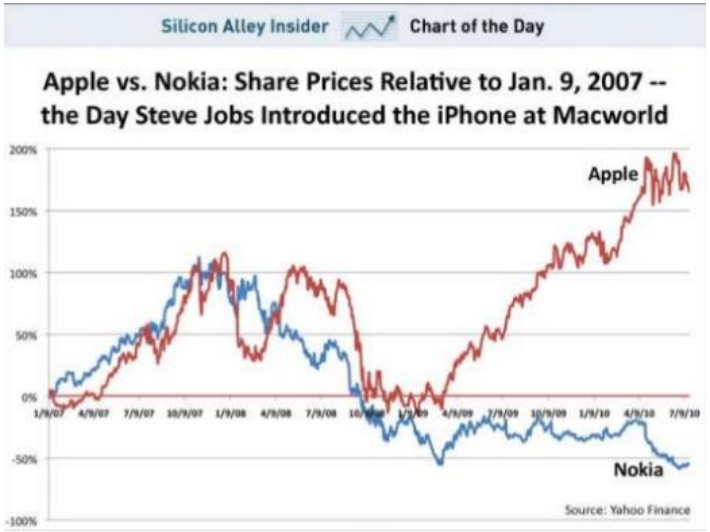
- Such mitigation can come from :

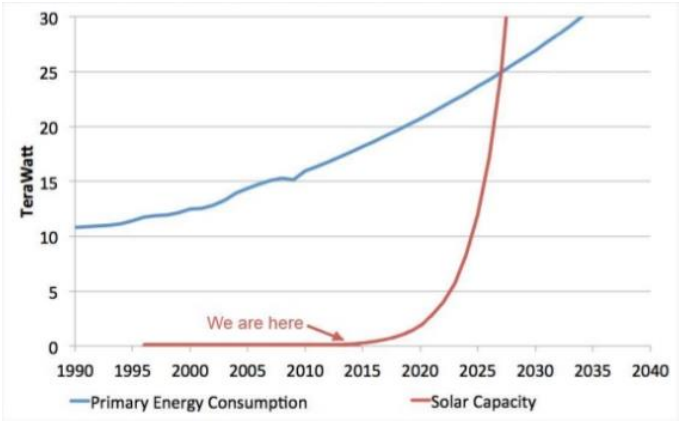
  - Contractual terms : for example :
    - open book contract and “semi-automatic” contract extension if the Rate of Return if still negative for the private contractor.
    - Allow high profit as to compensate the higher risks. However not socially well accepted.
    - Provide more flexibility in technical options and obligations by the contractor in order to focus more on results to be achieved, and thus empower more the contractor (for example smart networks option as shown previously).

  - External guarantees : here we come “back” to public “financing”

RISKS ARE INCREASING AND ARE LESS AND LESS PREDICTIBLE

- We live in a more disruptive world than ago.





PUBLIC FINANCING IS AS MUCH VALUABLE THROUGH THE GUARANTEE MECHANISMS THAN THROUGH THE LOANS

- A key role of public financing, apart from loans, is thus also to faciliate programs to become viable through the use of guarantees.

- Through their guarantees, public banks and IFIs can greatly help to :
  - Mobilize private investment (equity and debt) for strategic projects or sector support
  - Mitigate key government-related risks to enable financial viability and bankability
  - Reduce costs and improve financing terms for projects and public entities
  - Ensure long-term sustainability of projects

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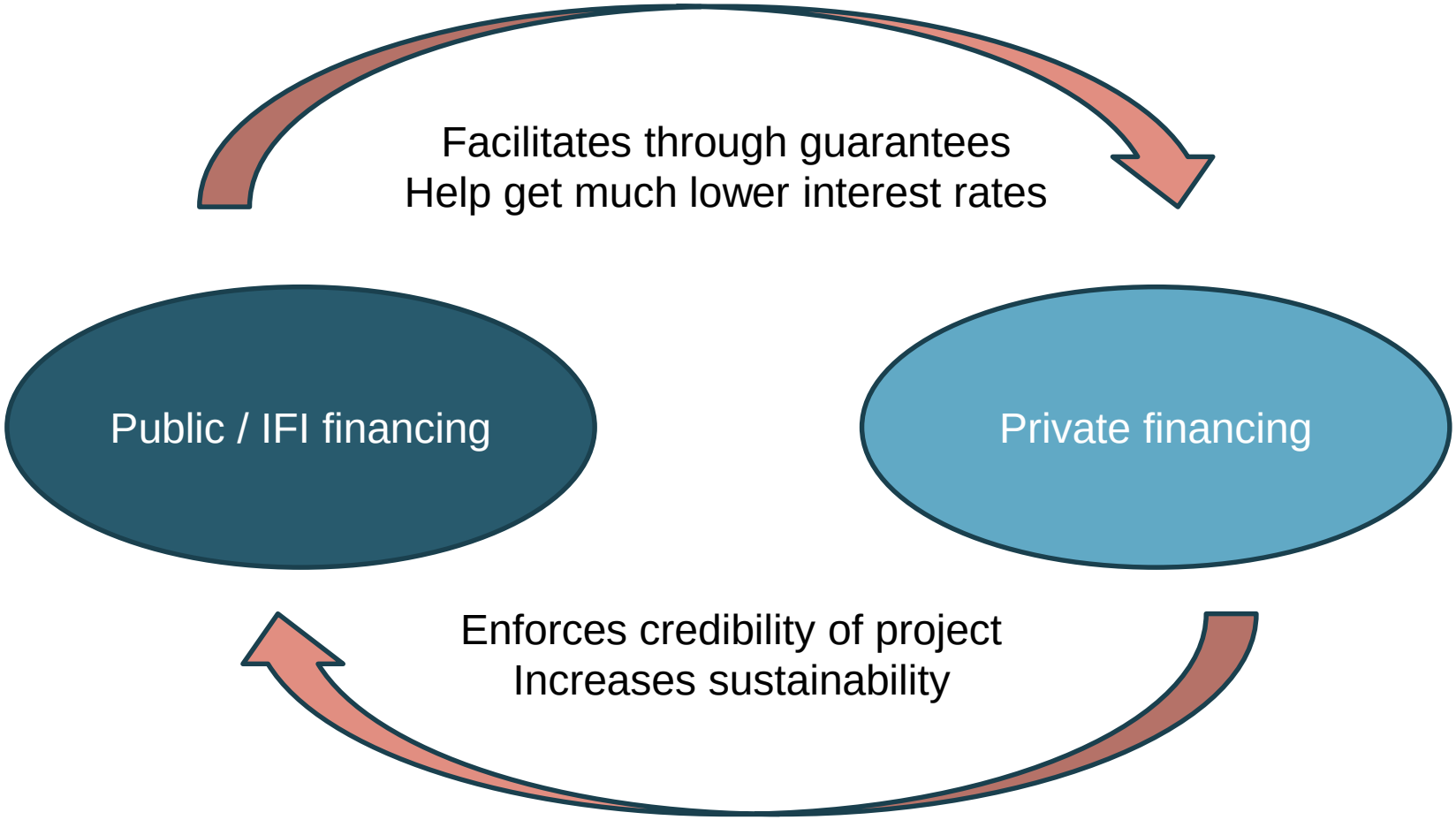
PUBLIC / PRIVATE FINANCING BALANCE



TYPES OF GUARANTEES (CF WB WEBSITE)

- **Project-based Guarantees**
  - Project-based Guarantees are applied in the context of specific investment projects where utilities wish to attract private investment (equity and/or debt).
  - **Loan Guarantees** – intended to provide risk mitigation to commercial lenders with respect to debt service payment defaults caused directly or indirectly by government or utility failure to meet specific payment and/or performance obligations arising from contract, law or regulation.
  - **Payment Guarantees** – intended to provide risk mitigation to private projects or to foreign public entities with respect to payment default on non-loan related obligations by government / utility.

- **Policy-based Guarantees**
  - Policy-based Guarantees can apply in the context of development policy operations where an IFI supports a member country with their program of policy and institutional actions that promote growth and sustainable poverty reduction.

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GUARANTEES (1/3)

- Public banks or IFIs can provide up to “AAA” risk mitigation with respect to obligations from public utilities to private investors.
- Risk mitigation is of a partial nature and aims at promoting balanced risk allocation between public bodies and private investors.

- Many risks can be covered, such as :
  - Contractual risk e.g. payment risk, performance risk, etc.
  - Regulatory risk e.g. change in law, negation or cancellation of license, tariff adjustments, etc.
  - Currency risk e.g. convertibility, transferability, etc.
  - Political risk e.g. expropriation, war and civil disturbance, etc.

- In general, public bank and IFI guarantees are potentially suitable to cover any risks which are not of a purely commercial nature.

GUARANTEES (2/3)

- **Advantages of using guarantees from public banks or IFIs :**

- **For Private Investors**
  - Improvement of the overall credit quality of the investment through the partial use of a rated instrument to mitigate key risks
  - Reduction of key risk drivers which are beyond the control of private investors
  - Mitigation of counterparty risk with governments or public-owned entities
  - Support to maintain or open new markets despite credit downturns
  - Project bankability, sustainability, and replicability

GUARANTEES (3/3)

- **Advantages of using guarantees from public banks or IFIs :**

- **For Utilities**
  - Facilitate private contracting
  - Diversification of financing sources beyond development financing
  - Reduction of project costs and cost of commercial financing to affordable levels
  - Reduction of utility risk exposure through sharing with private sector investors
  - Project bankability, sustainability, and replicability

Thank you for your attention.

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