



**15th INTERNATIONAL OPERATIONS & MAINTENANCE CONFERENCE** IN THE ARAB COUNTRIES  
UNDER THE THEME: “**SMART MAINTENANCE**” CONICIDE WITH THE 15<sup>TH</sup> ARAB MAINTENANCE EXHIBITION

# **CORPORATE FLEET COST CONTROL – CASE STUDY**

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A vertical image on the left side of the slide shows an industrial worker in a red jumpsuit and white hard hat working on a complex network of pipes and scaffolding. The image has a reddish tint.

# CONTENT

- STORY BACKGROUND
- PROJECT DESCRIPTION
- ASSET REPLACEMENT CYCLE
  - PREREQUISITIES
  - CALCULATION
- CONCLUSION AND COMMENTS



„We don't have to be top economists to know, that purchase of a brand new car is one of the worst investments.“

# STORY BACKGROUND

RUSSIAN CAR MARKET, 2012

LARGE AUTOMAKER'S PLANT (>300 000 cars/year)

LASTING ECONOMIC CRISIS

CRISIS MANAGEMENT PERIOD

POTENTIALS FOR SAVINGS SOUGHT IN PLENTY OF AREAS



*illustration*

# PROJECT OF CORPORATE FLEET OPTIMIZATION – INITIAL SITUATION

UP TO 2000 CARS, used for:  
benefits, marketing, business trips, transfers, production and logistics, research and development, security and others

**FLEET FRAGMENTED** into 5 departments, certain part outsourced

**ABSENCE OF RULES** for allocation of cars to employees

**NO REPLACEMENT CYCLE** defined

**NO SHARED POOL** of cars and drivers

**SUPPORT BY IT LIMITED**



*illustration*



## PROJECT OF CORPORATE FLEET OPTIMIZATION - GOALS

1. To reduce fleet size by 30%
2. To centralize fleet under one department
3. To set up rules for car allocation to departments and employees
4. To set up central car pool, monitoring and reporting
5. **To use unsold production in corporate fleet, with:**
  - Emphasis on HIGHEST POSSIBLE UTILIZATION
  - Aim to PROVIDE BENEFITS to employees
  - SUPPORT OF PROMOTION of new models
  - **Goal to set OPTIMAL REPLACEMENT CYCLE with maximization of Net economic effect**

# ASSET REPLACEMENT CYCLE

## DEFINITION

„A period of time between the purchase of an asset and its replacement with an equivalent asset“ Farlex

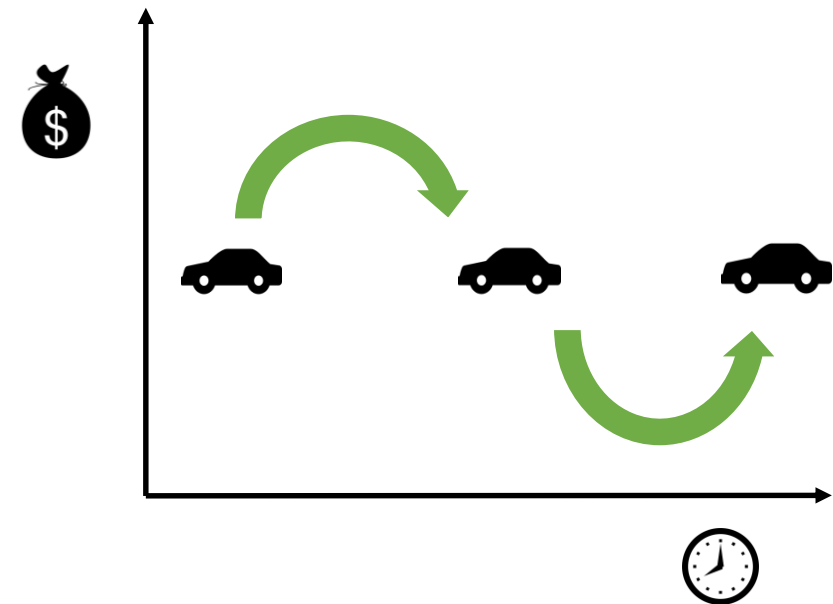
## METHODS

Economic Lyfecycle

Focusing on Age/Mileage

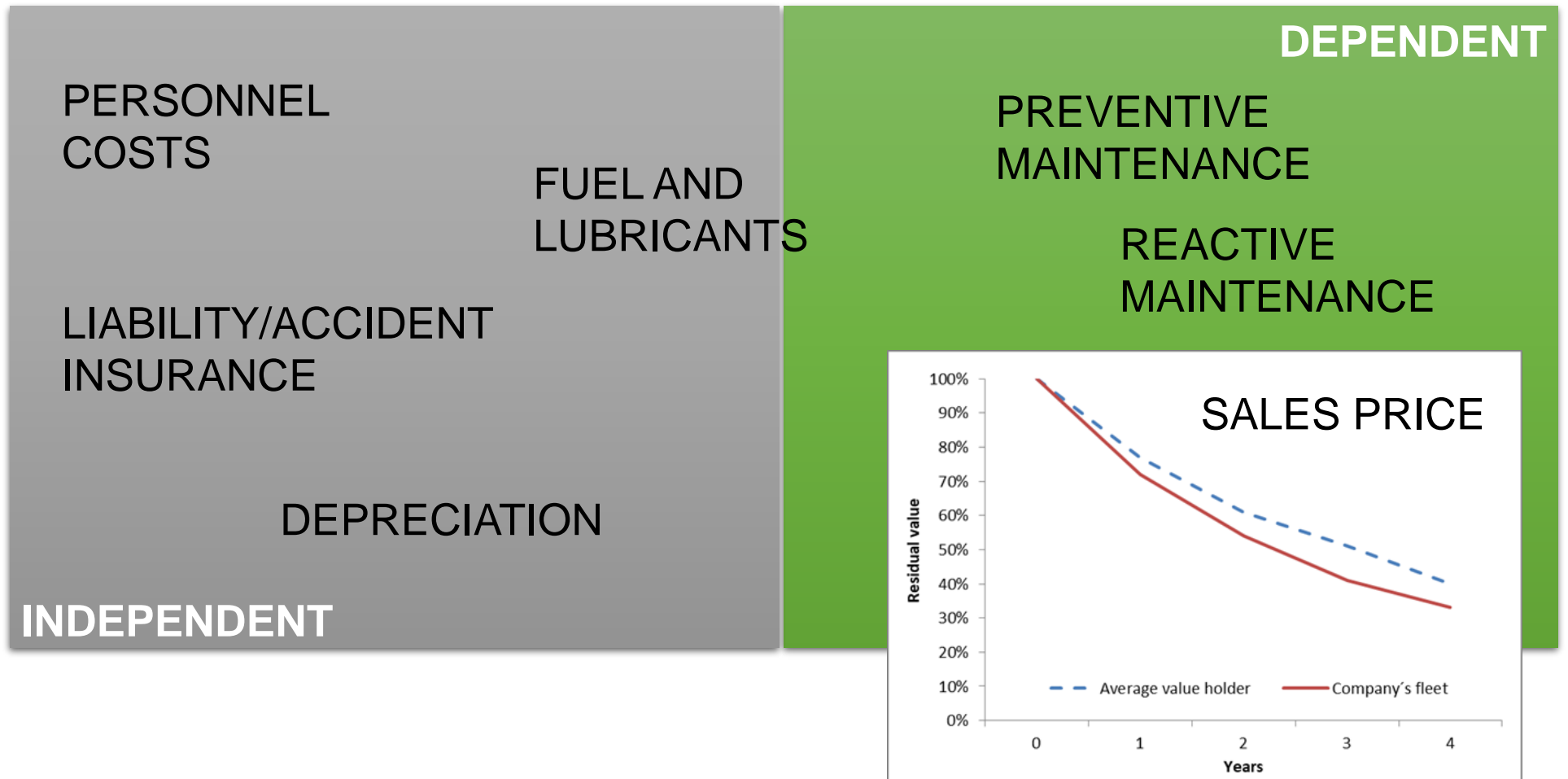
Exceeding a Threshold Cost

Cost of Repair vs. Residual Value



# FLEET REPLACEMENT CYCLE CALCULATION - INPUTS

Relevant are only costs dependent of time of use of asset:



# FLEET REPLACEMENT CYCLE CALCULATION - METHODOLOGY

To find local minimum of function of **Average Replacement Unit Costs**

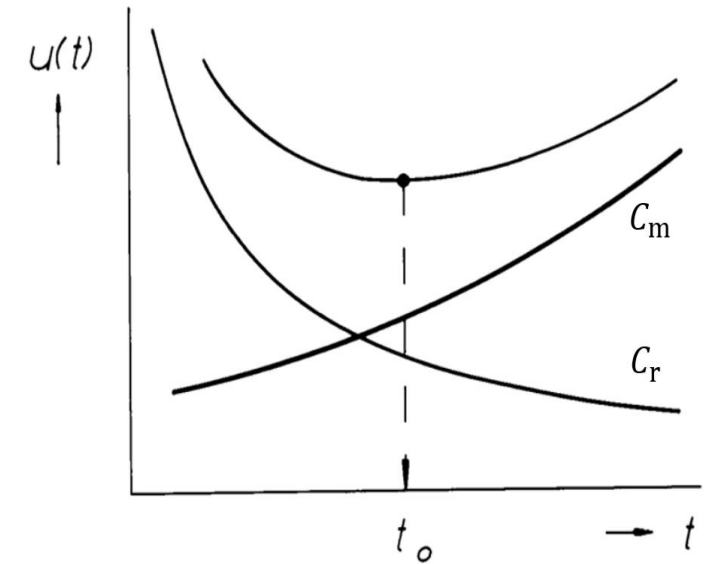
$$u(t) = \frac{C_r(t) + C_m(t)}{t} = \frac{C_r(t)}{t} + \frac{C_m(t)}{t}$$

$C_r$  – Cost of replacement: costs of introduction of new vehicle into fleet, from which sales price is subtracted

$C_m$  – Cumulative sum of performed preventive and reactive maintenance and repairs on individual car

$t$  – Time, in which asset is replaced

$u(t)$  – Objective function

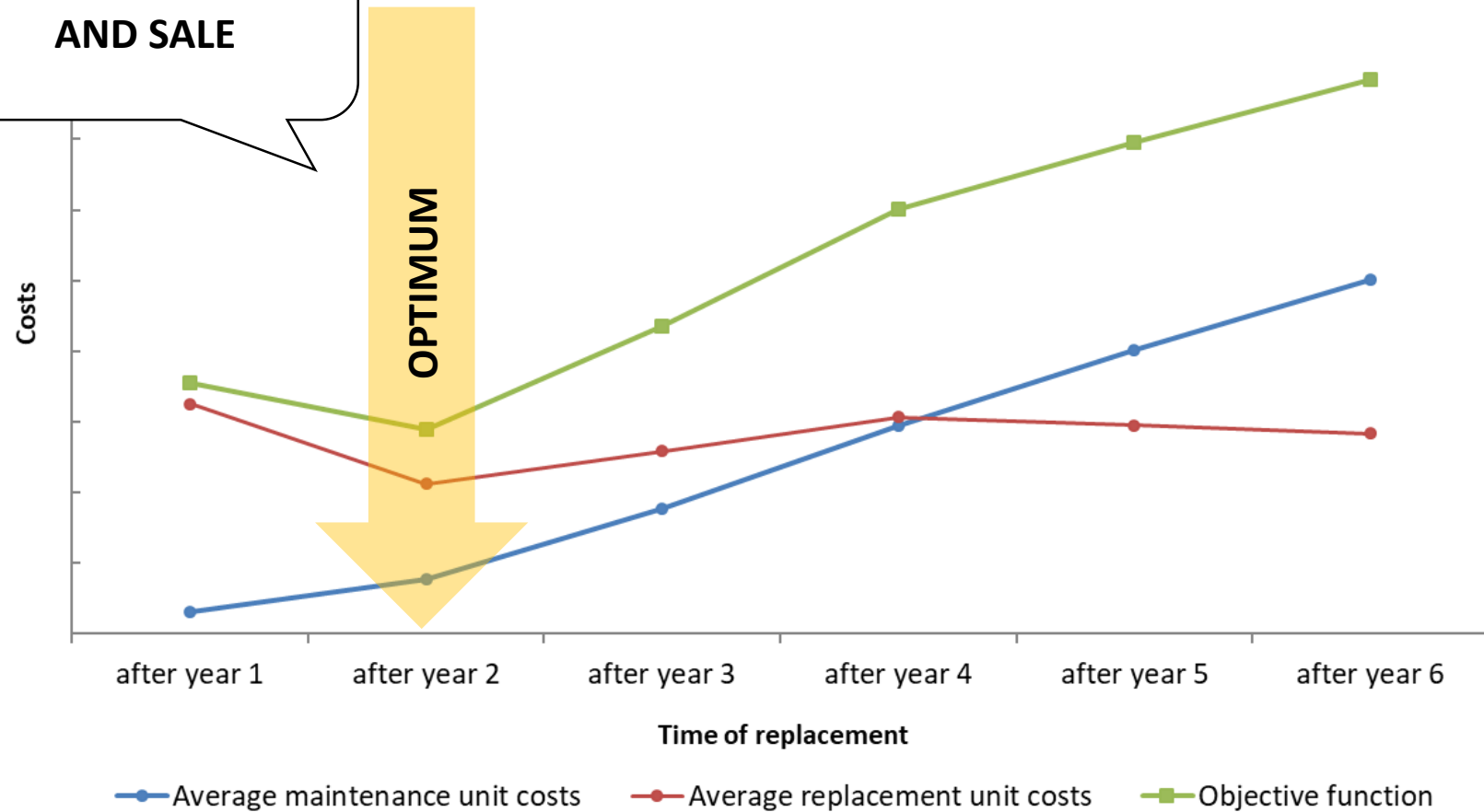


[Source: Wilson, Havlíček, Hladík]

# FLEET REPLACEMENT CYCLE CALCULATION - OUTPUT

$$u(t) = \frac{C_r(t) + C_m(t)}{t} = \frac{C_r(t)}{t} + \frac{C_m(t)}{t}$$

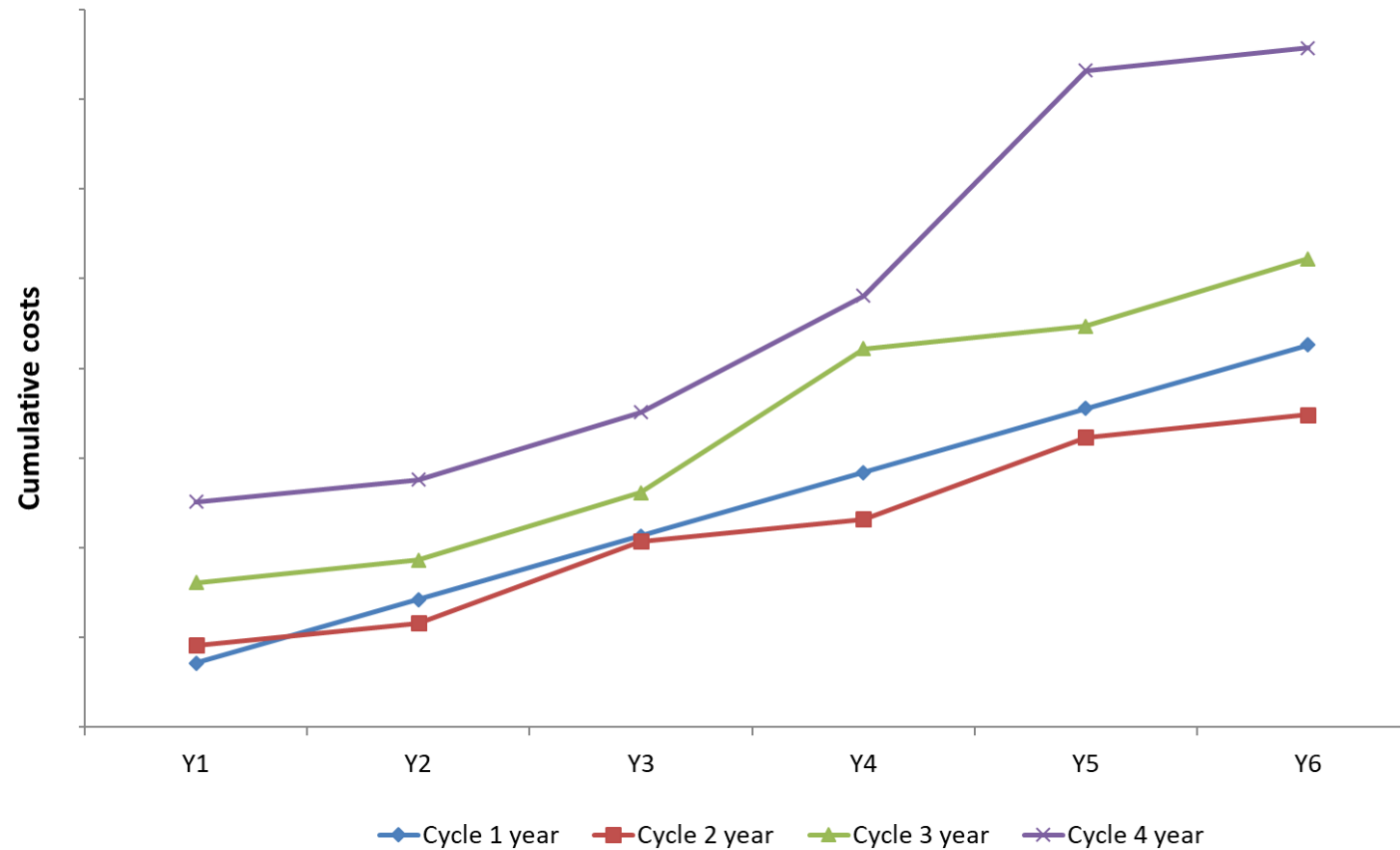
USAGE OF 2 YEARS  
AND SALE





# FLEET REPLACEMENT CYCLE CALCULATION – OUTPUT

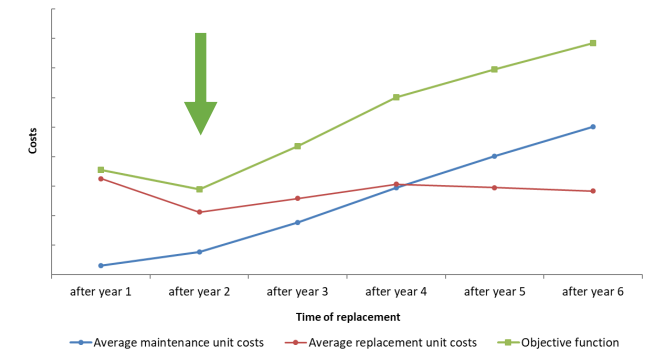
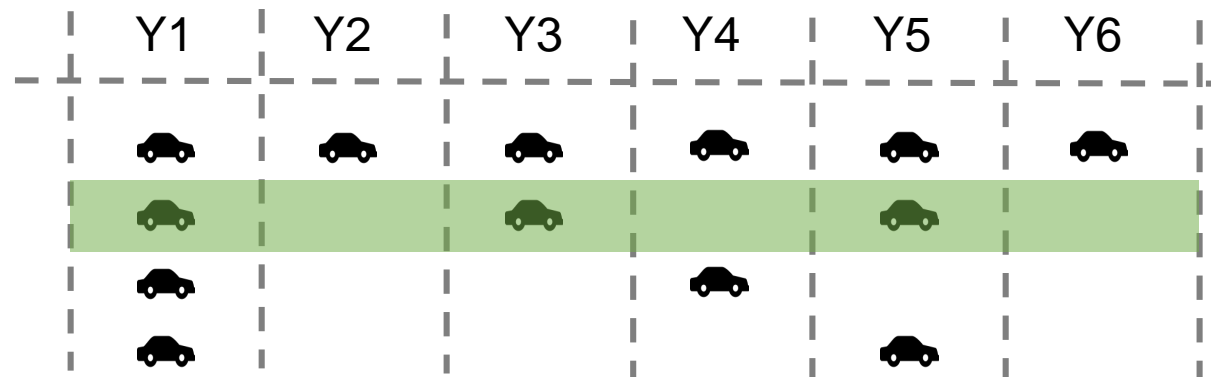
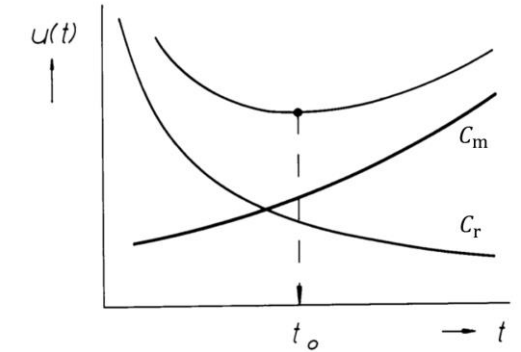
Verification - Comparison of cumulative costs:



Comparison of investments with different lifespan, thus adjustment of NVP is applied

# CONCLUSION

- Objective function does not follow arcuate shape
- Sale significantly reduces replacement cost
- Difference of acquiring and selling is minimal in comparison to trend of maintenance costs - which significantly affects the objective function



**Optimal replacement cycle for given model is 2 years**

A vertical image on the left side of the slide shows an industrial worker in a red jumpsuit and white hard hat working on a complex network of pipes and machinery in a refinery or chemical plant.

## PROJECT NOTES

WORK WITH **RELEVANT DATA** AND **METHODOLOGY**

YOU **CAN'T MANAGE**, WHAT YOU **CAN'T MEASURE**

**CORPORATE FLEET** IS USEFUL INSTRUMENT TO HANDLE  
FLUCTUATIONS OF PRODUCTION AND MARKET



THANK YOU