The project and BSRIA's role in it

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Nanopigmy

- The project
  - Objectives, who is involved, progress so far
- BSRIA's role
  - Validating the business benefit of the innovations being developed
- Applying the validation principles to business practice

The Nanopigmy project

- EU Framework 7 project
- Running from 1 March 2012 to 28 Feb 2015
- 8 partners (3 Spain, 2 UK, 1 Italy, 1 Poland, 1 Netherlands)
- Budget of €4.6million

Nanopigmy objectives

- Produce multi-functional pigments …
- … for construction and automotive applications …
- … that deliver economic and environmental benefit …
- … by simplifying component manufacture and …
- … improving operational performance.

Nanopigmy partners

Nubiola Spain	BSRIA UK	AMU Poland
Tekniker Spain		Pinova Netherlands
Acciona Spain	PMB UK	Fiat Research Italy

Progress so far

- Pigment functionalities specified
  - Thermal storage, infra-red reflectance, antibacterial, self cleaning, self healing
- Laboratory formulations of 6 pigments with selected pairs of functionalities
- Pilot plant manufacture of some pigments
- Definition of construction demonstrators

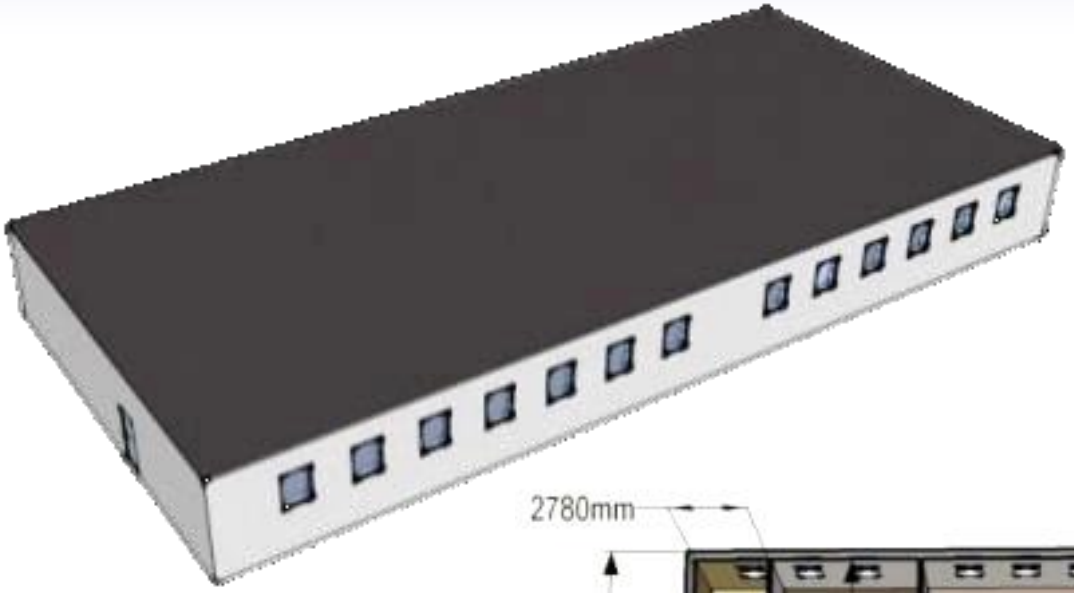
BSRIA's role

- Validate the economic and environmental costs and benefits of each pigment in relation to traditional solutions
- Life cycle costing to assess economic impacts
- Life cycle assessment to identify environmental impacts

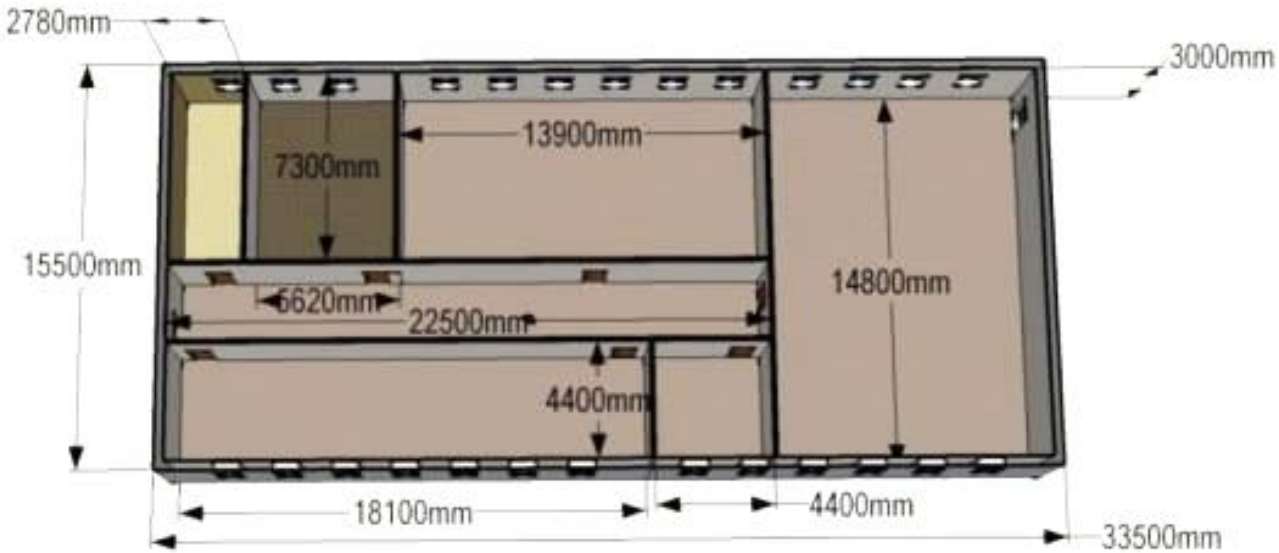
Pigments we are validating

- A Thermal storage + antibacterial in paint and polymer board
- B Thermal storage + self-cleaning in concrete render
- C Infra red reflectance + self cleaning in concrete render

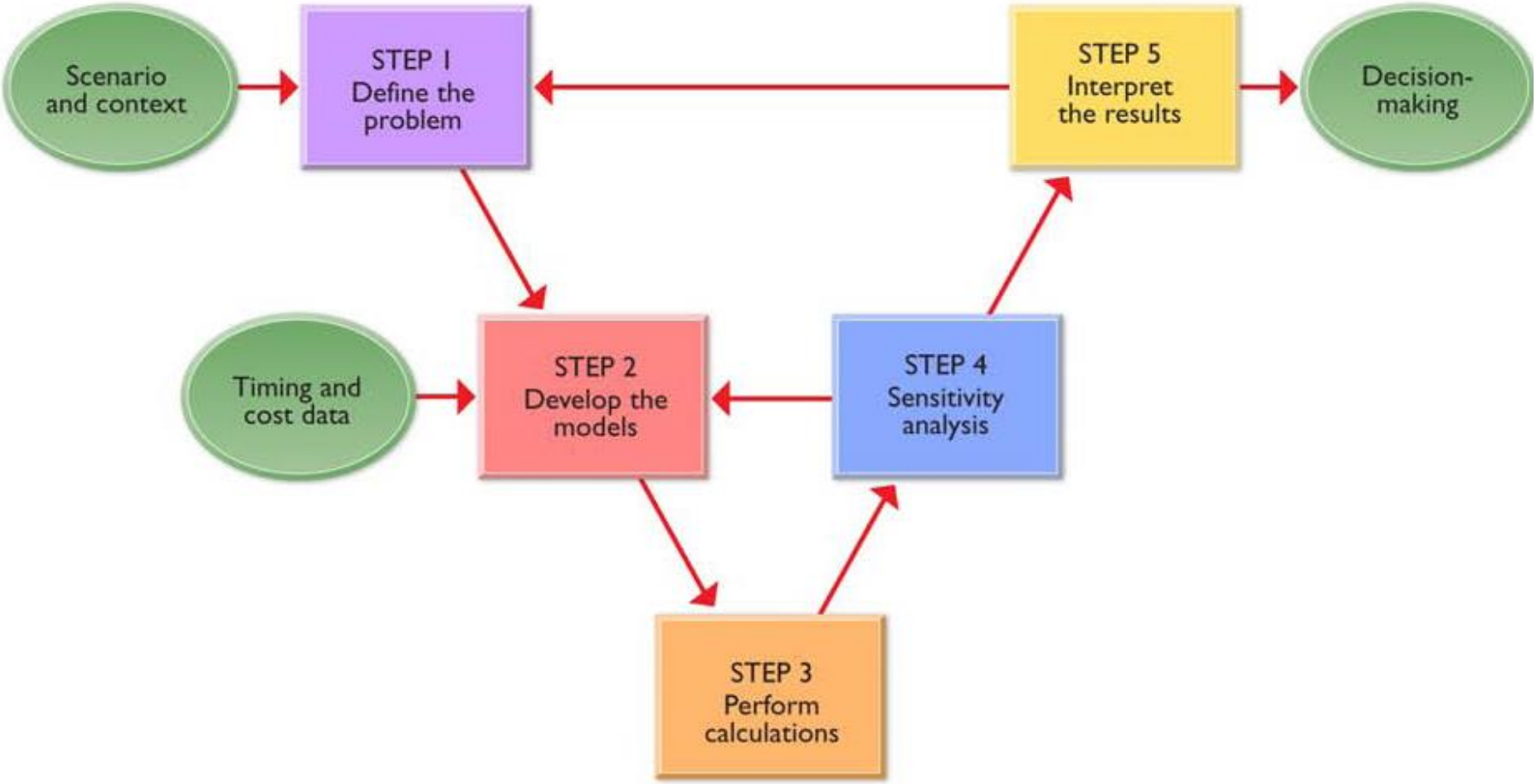
Base Case vs Nanopigmy



- Define an office building with enough features to test the consequences of the Nanopigmy pigments



Life cycle costing

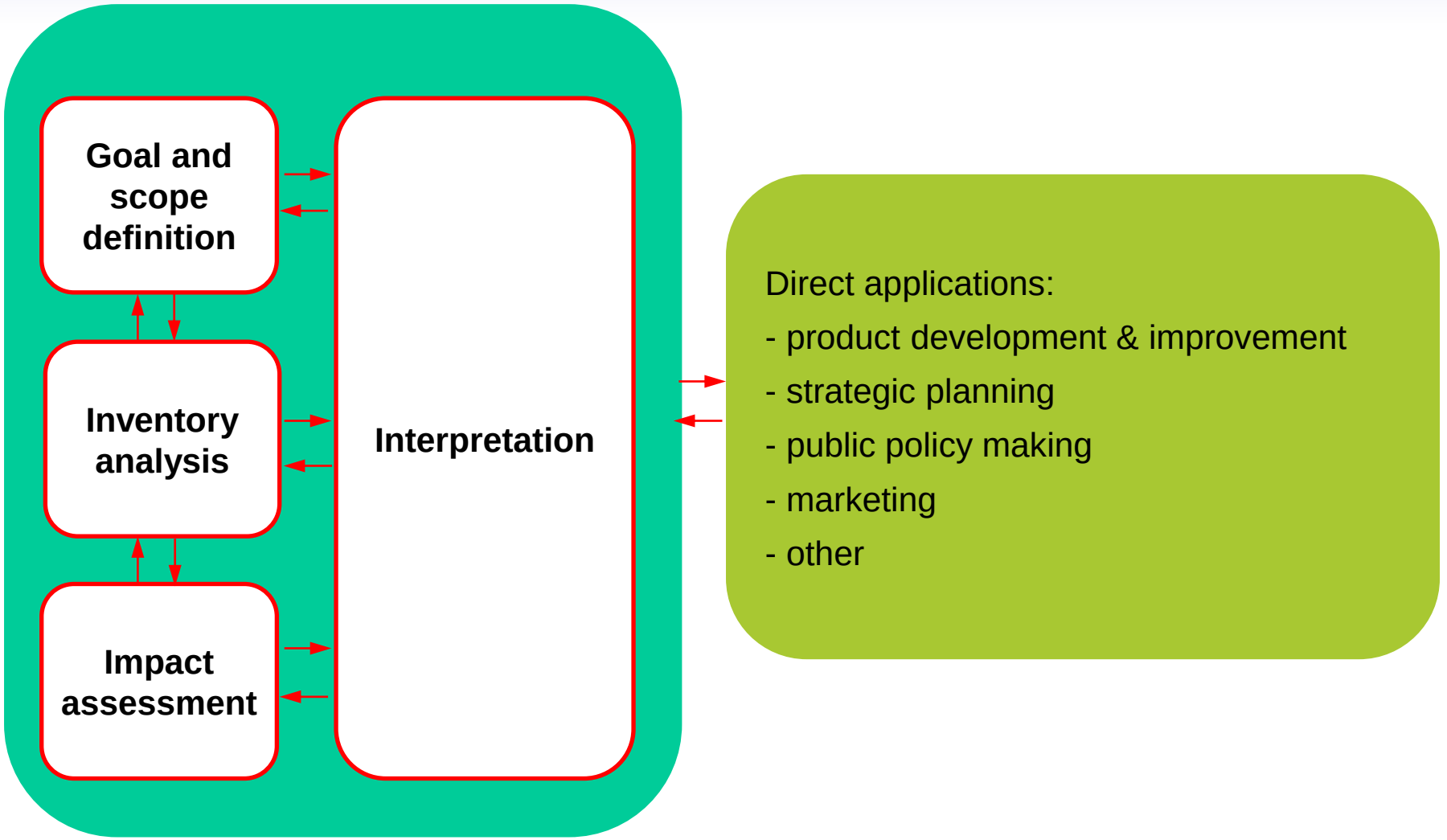


LCC results so far

- Life cycle costs analysed using BSRIA's LCC Calculator (100 years, 6% discount rate)

Data category	Original paint /walls cleaned daily	Modified paint /walls cleaned weekly	Original polymer board	Modified polymer board
Cooling load	10,770 kWh/y	10,713 kWh/y	10,920 kWh/y	10,346 kWh/y
Heating load	16,348 kWh/y	Same	16,471 kWh/y	Same
Construction cost (NPV)	£173,881	Same	£170,792	Same
Maintenance cost (NPV)	£52,250	£37,042	£50,269	£35,060
Operating cost (NPV)	C £19,507 H £7,578	C £19,404 H £7,578	C £19,779 H £7,636	C £18,740 H £7,636
TOTAL (NPV)	£253,216	£237,906 (-6.0%)	£248,476	£232,228 (-6.5%)

Life cycle assessment



LCA results so far

- Environmental impacts analysed using Sima Pro

Data category	Original paint /render IR=0.3	Modified paint (thermal store only)	Double quantity of modified paint	Modified render IR=0.5	Modified render IR=0.7
Cooling load	10,770 kWh/y	10,713 kWh/y	10,656 kWh/y	8,078 kWh/y	5,924 kWh/y
Heating load	16,348 kWh/y	Same	Same	17,165 kWh/y	17,983 kWh/y
Global warming potential	1,280,000 kg CO_2 eq	1,270,000 kg CO_2 eq (-0.3%)	1,290,000 kg CO_2 eq (+0.3%)	1,148,881 kg CO_2 eq (-10.25%)	1,055,455 kg CO_2 eq (-17.5%)
Endpoint impact assessment	144,000 Ecopoints	143,500 Ecopoints (-0.3%)	145,700 Ecopoints (+1.2%)	131,052 Ecopoints (-9.0%)	121,826 Ecopoints (-15.4%)

Applying the principles to business

- Life cycle costing and life cycle assessment allow the effects of a material or product innovation to be considered in advance

- Can indicate where innovations have most impact
- Can help avoid costly mistakes

- Close liaison with supplier/manufacturer is needed to obtain robust data

Thank you

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