Introduction to Ratio CASE

Big Science Industry meet

09-02-2026

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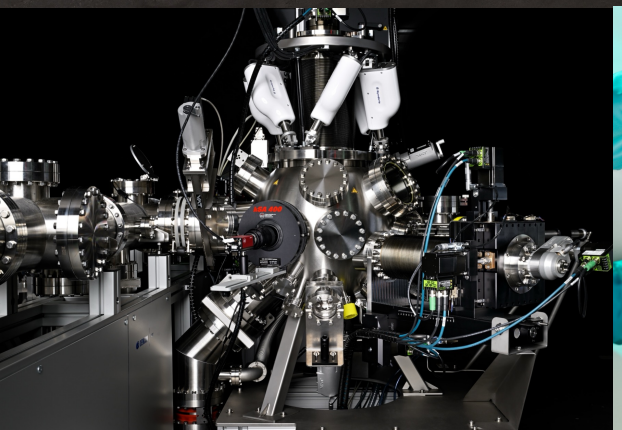
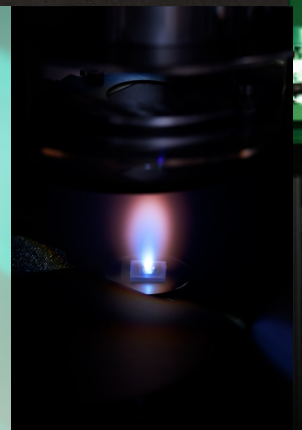
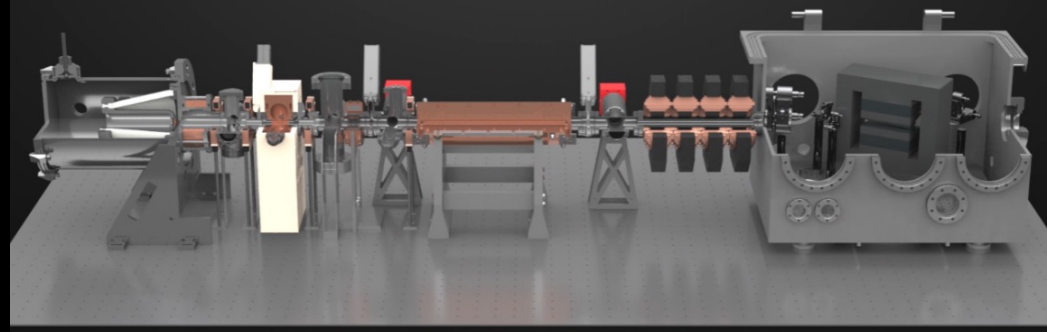
PLD4Energy ©DIFFER / Bart Overbeeke



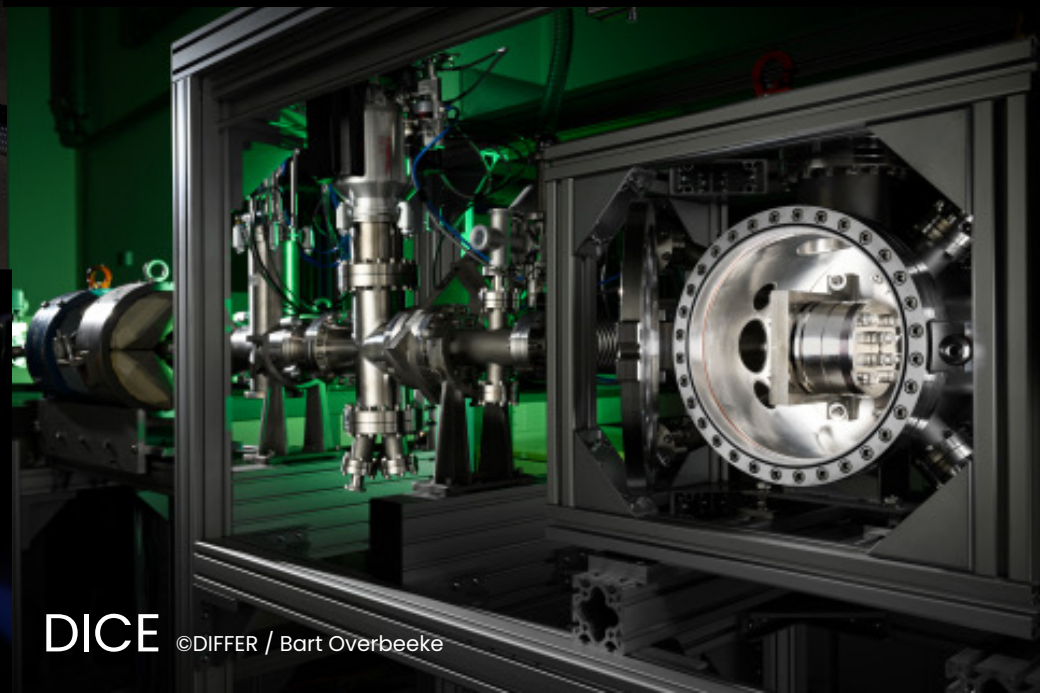


SMART*Light



Interreg
Vlaanderen-Nederland

Gefinancierd door
de Europese Unie



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What is the value of systems engineering for big Science?

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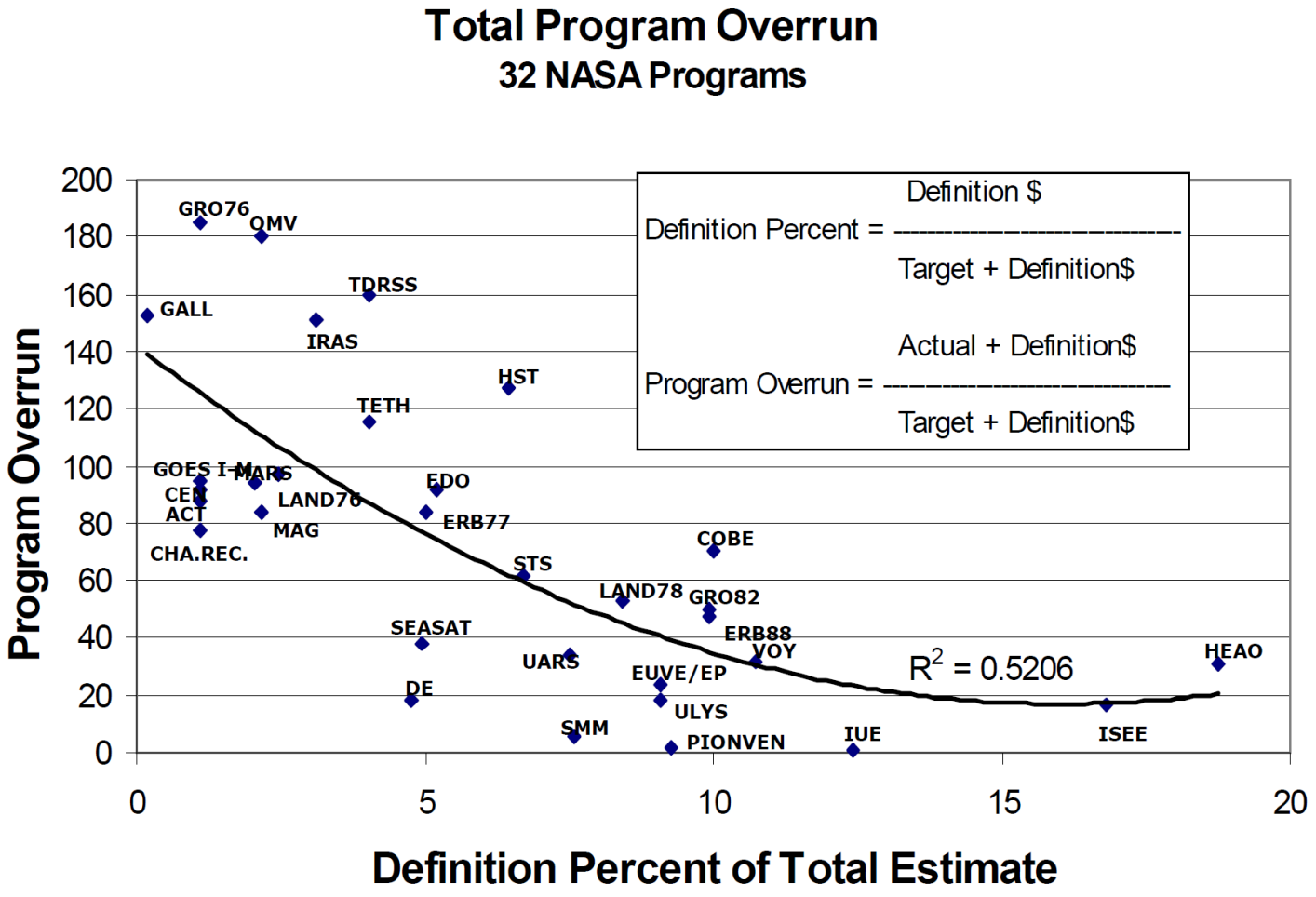
A reality check

Reality:

- Only 0.5 % of projects are on time, within budget and deliver the value that was promised.

Project type	Mean cost overrun (%)	Projects (A) with ≥50% overruns (%)	Mean overruns of A projects (%)
Nuclear storage	238	48	427
Olympic Games	157	76	200
Nuclear power	120	55	204
Hydroelectric dams	75	37	186
IT	73	18	447
Nonhydroelectric dams	71	33	202
Buildings	62	39	206
Aerospace	60	42	119
Defence	53	21	253
Bus rapid transit	40	43	69
Rail	39	28	116
Airports	39	43	88
Tunnels	37	28	103
Oil and gas	34	19	121
Ports	32	17	183
Hospitals, health	29	13	167
Mining	27	17	129
Bridges	26	21	107
Water	20	13	124
Fossil thermal power	16	14	109
Roads	16	11	102
Pipelines	14	9	110
Wind power	13	7	97
Energy transmission	8	4	166
Solar power	1	2	50

Empirical proof of SE effectiveness



Gruhl, W. (1992). Lessons learned, cost/schedule assessment guide, Internal presentation, NASA Comptroller's office.

Value of systems engineering (Honour, 2023)

Systems engineering has a Return-On-Investment of 3.5

System architecting and **technical leadership** are the two top SE activities that contribute the most to project success.

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Honour, E. C. (2013). *Systems engineering return on investment* (Ph. D. thesis). University of South Australia.

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