

MEASURING ENERGY SAVINGS IN BUILDINGS

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Context (white certificates)

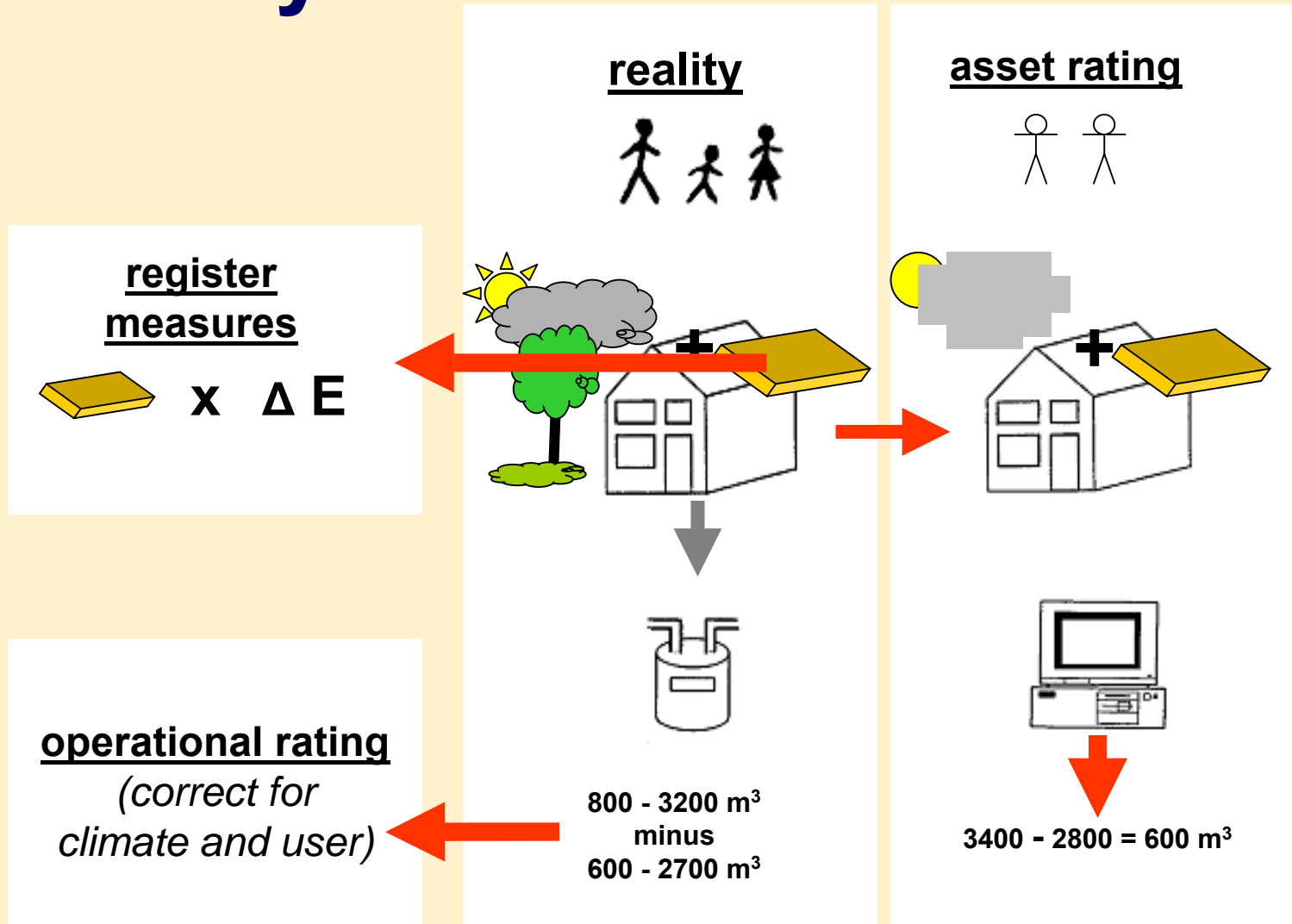
Certificates should provide:

- **Adequate representation of savings or CO₂ reduction (accuracy)**
- **Reproducible**
- **Acceptable assessment cost**
- **Feasible registration scheme**
- **Feasible quality assurance**

Assessment principles

- Register energy saving measures taken (separate set-up)
- Assess the improvement of the energy performance of the building (synergy with the EPBD)
 - asset rating
 - operational rating

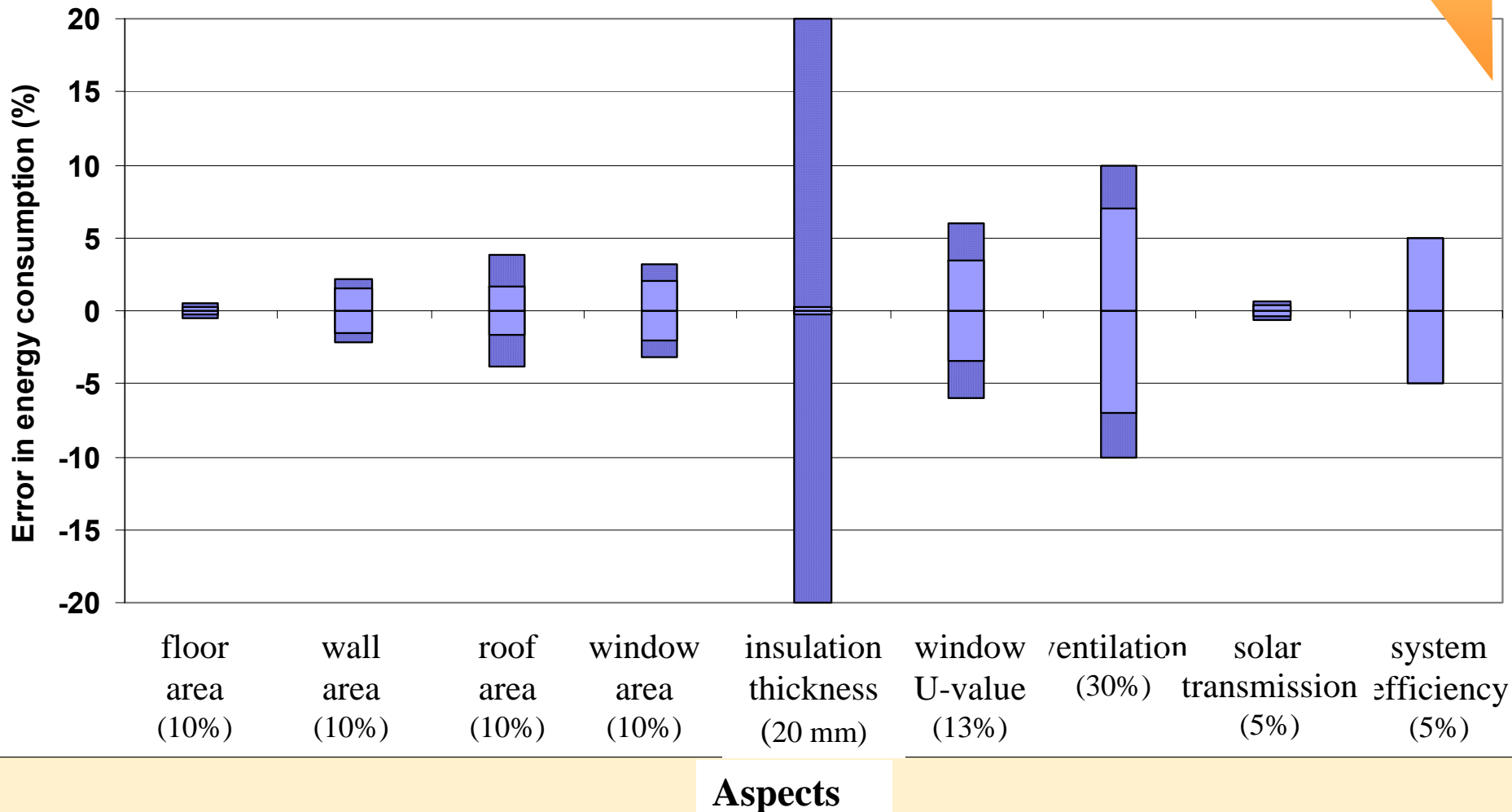
Reality / assessment



Effect of conditions

- **External (climate deviations in time)**
 - Heating load dominated buildings
(degree days 20 % difference)
- **Internal (user behaviour)**
 - Temperature
(average value may differ 5° C; i.e. +/- 30%)
 - Ventilation
(factor 2 or 3)

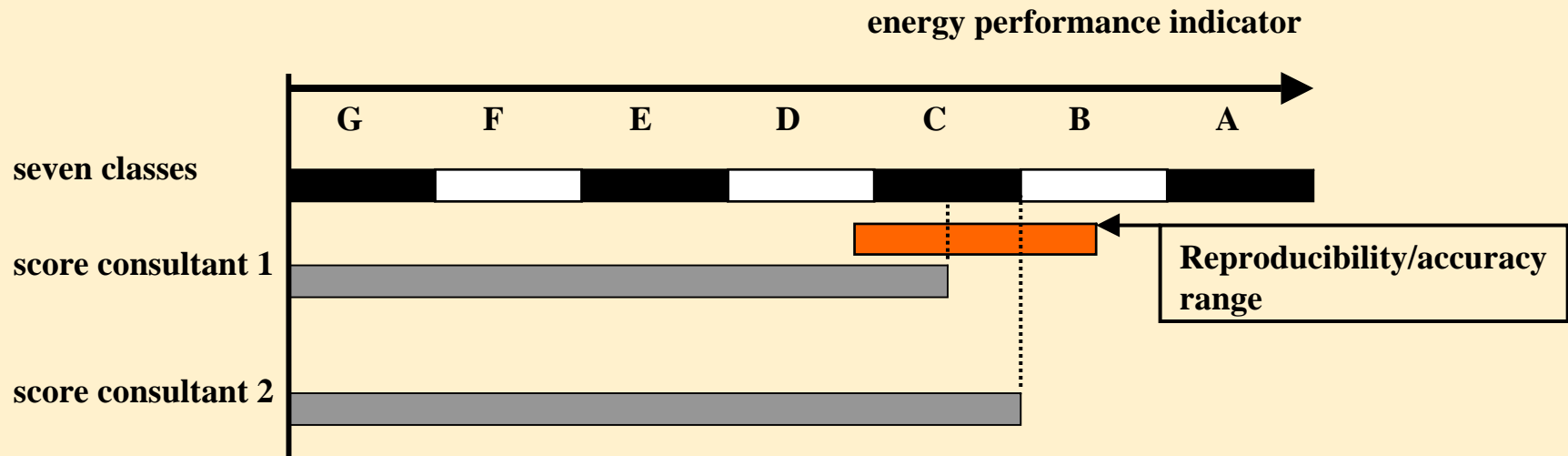
Effect of inspection errors



Expressing the building EP

- Neutralise user behaviour **Energy Effort**
- Neutralise size **Energy Effort**
- Neutralise form (compactness) **Energy Effort**
- Express purchased, primary energy or CO₂ emission **Energy Effort**
- What type of energy flows to include (heating, cooling, hot water, lighting) **Energy Effort**
- Express as a value instead of classes **Energy Effort**

Reproducibility in certification



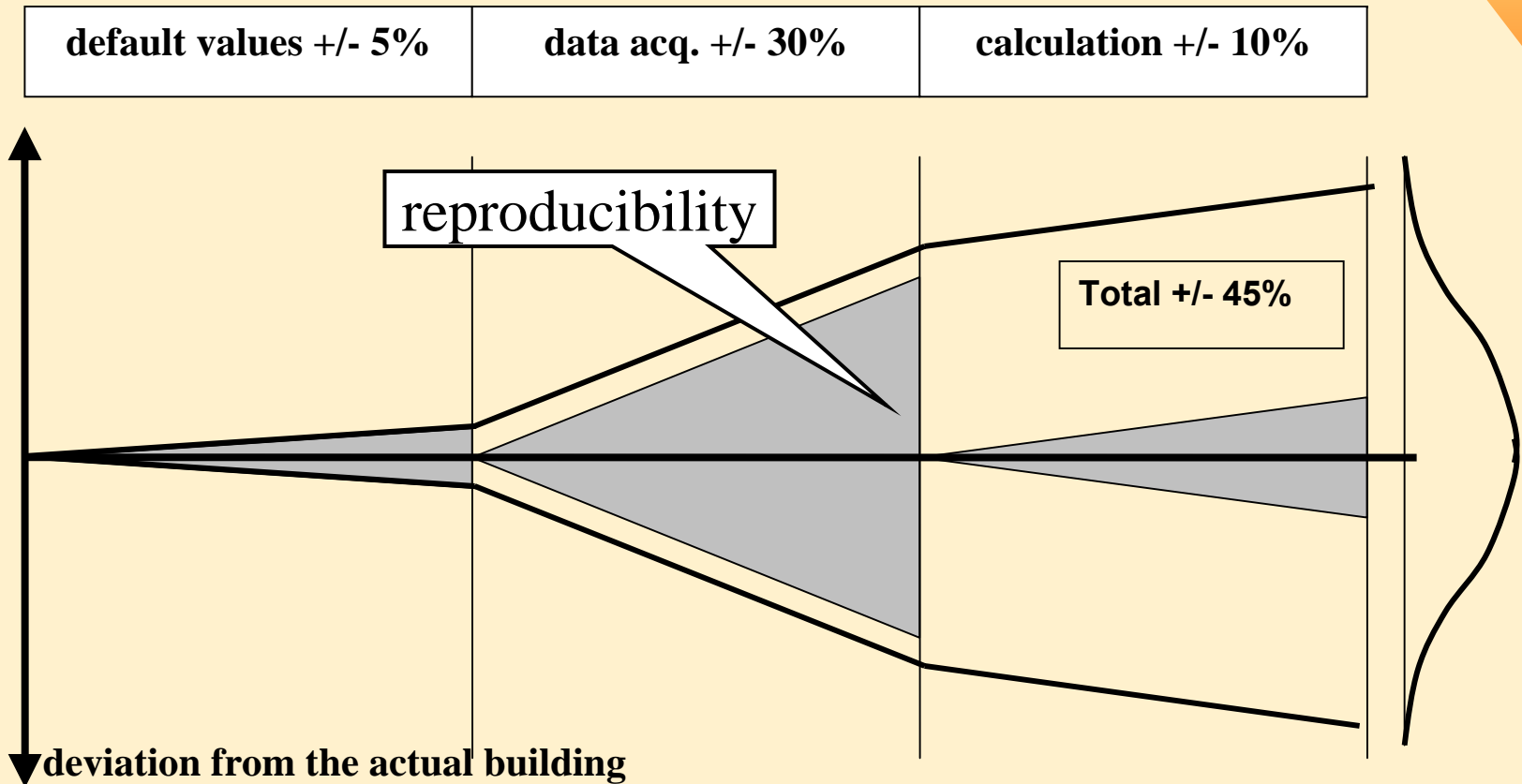
Assessment process

Stages are dependent on building type, type of client, number of buildings

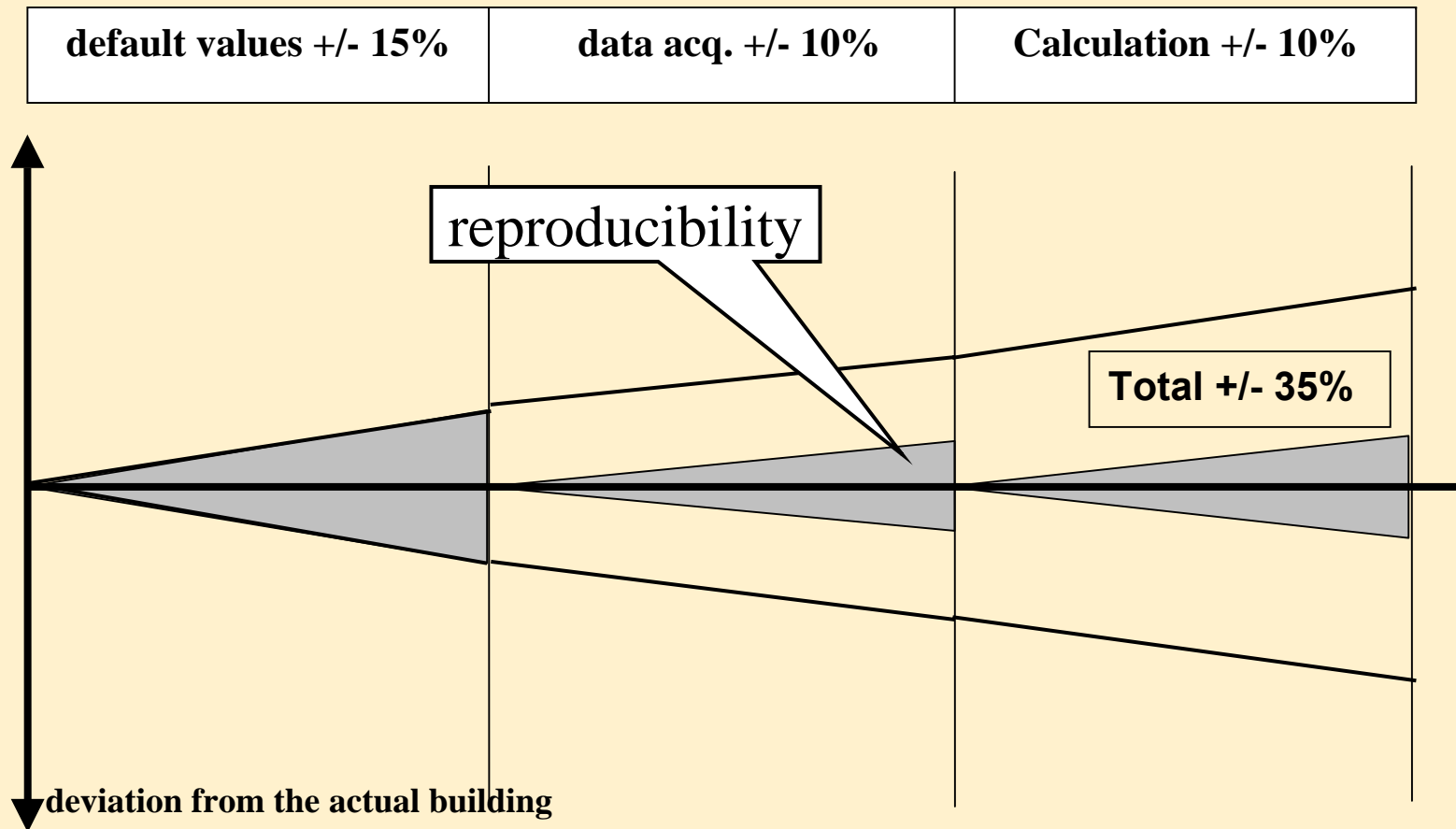
Typical stages

- Intake
- **Data acquisition**
- **Calculation (using default values)**
- Report (certificate)
- (Support energy saving measures)

Accuracy and reproducibility



Balancing accuracy's



Comparing approaches

	Register measures	Asset rating	Operational rating
• Adequate accuracy	-	-	--
• Reproducible	+	+	--
• Acceptable cost	-	+ (EPBD)	++ (EPBD)
• Feasible registration	+	++ (EPBD)	++ (EPBD)
• Feasible quality control	+	+ (EPBD)	++ (EPBD)

Conclusions, recommendations

- **There is an important synergy between the EPBD and White Certificates; they are highly complementary (making EP transparent; taking measures)**
- **Define a clear and operational objective for White Certificates**
- **Attune the development and implementation of White Certificates and the EPBD**

Conclusions, recommendations

- **Straight forward asset rating seems the most adequate approach; especially when combined with the EPBD**
- **Straight forward operational rating is expected to be less appropriate**
- **Registering measures can be appropriate but requires a separate scheme (non-EPBD)**
- **Balance the performances of the approach (accuracy, reproducibility, cost, feasibility of the scheme)**

THANK YOU