Local Programme Component

"How to choose the most efficient glazing for refurbishment of residential buildings projects, maintaining balance between natural (daylight) heating and overheating?"

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AH51P-19S

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Synopsis. Key points

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b) Is the problem of overheating relevant to refurbishment of traditional residential buildings in Denmark?
c) How to solve the problem of overheating in refurbishment projects?

Synopsis. Key points

Methodology and structure

a) Theoretical basis: books, articles, websites
b) Research methods: live measures and simulation
c) Empirical data: interviews with employees in Danish building industry

Synopsis. Key points

First conclusion

a) Positive and negative effect of daylight
b) Comprehensive analysis
c) Shading and glazing use

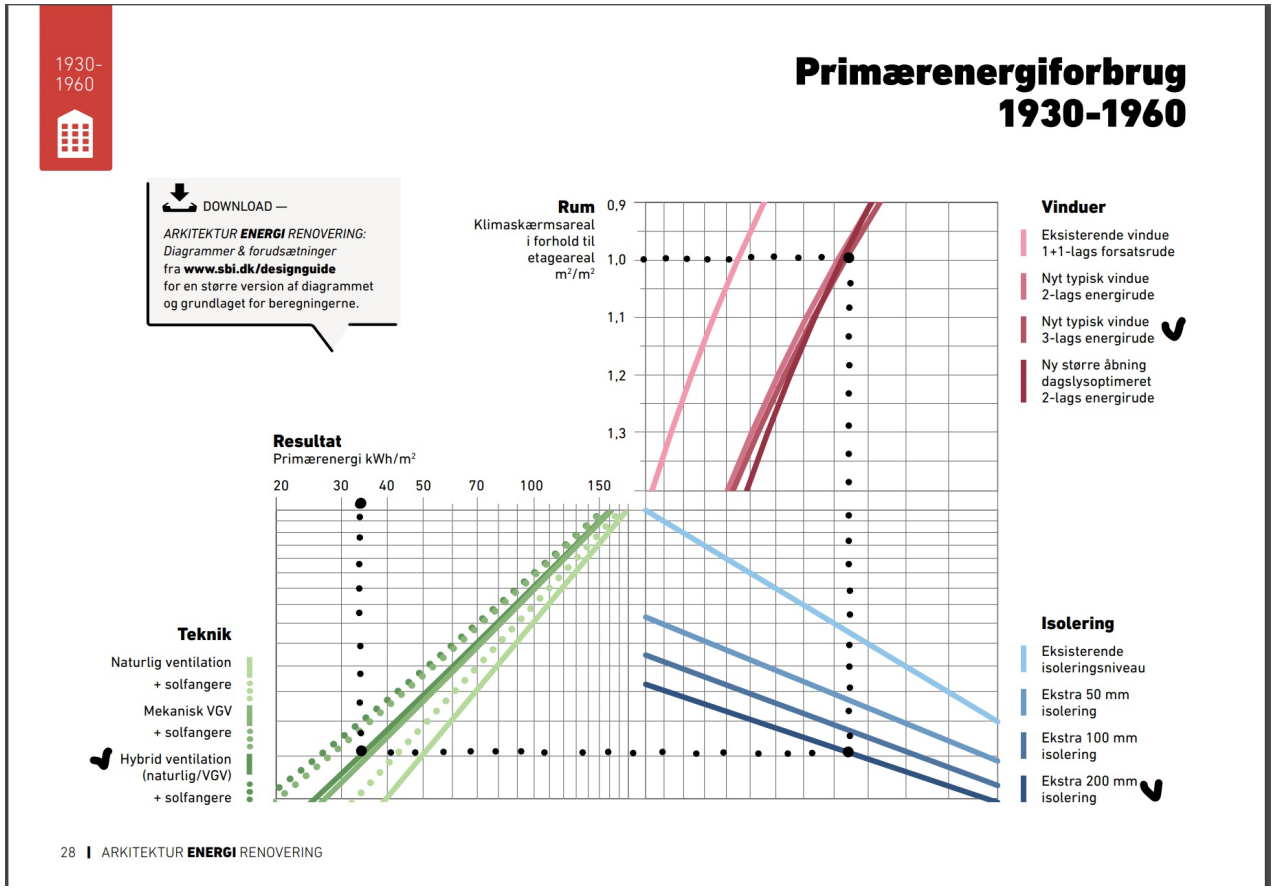
Synopsis

Research questions

Interview questions

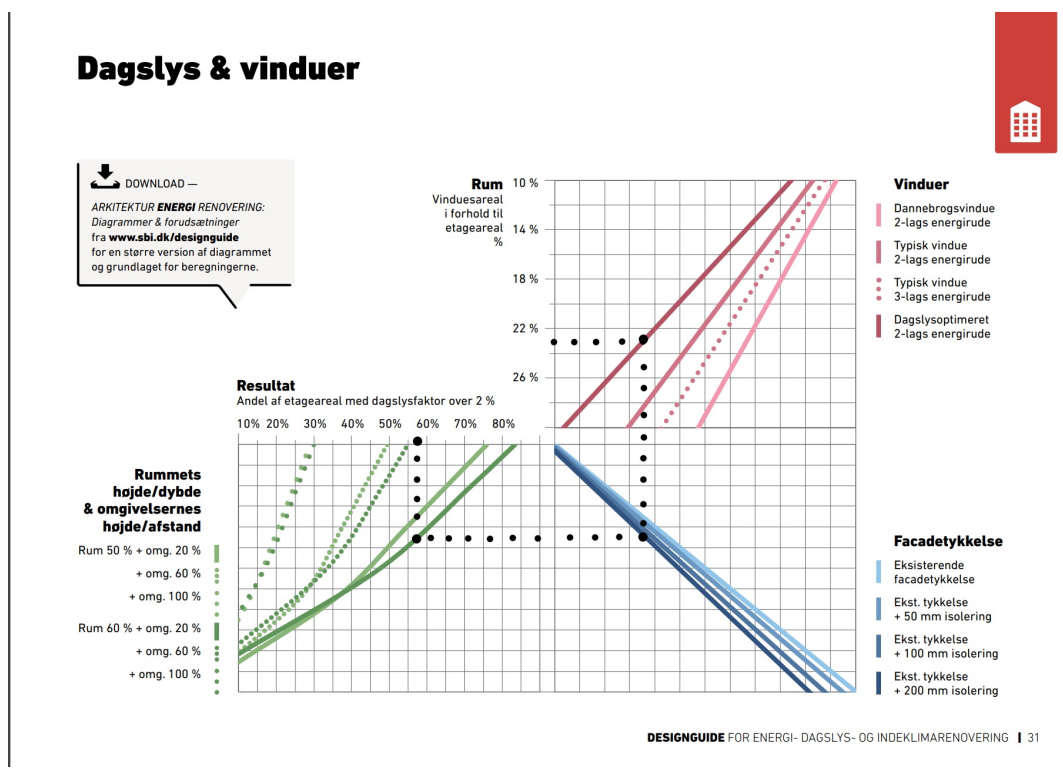
1.1 How glazing parts and their specifications contribute to natural heating and indoor climate?

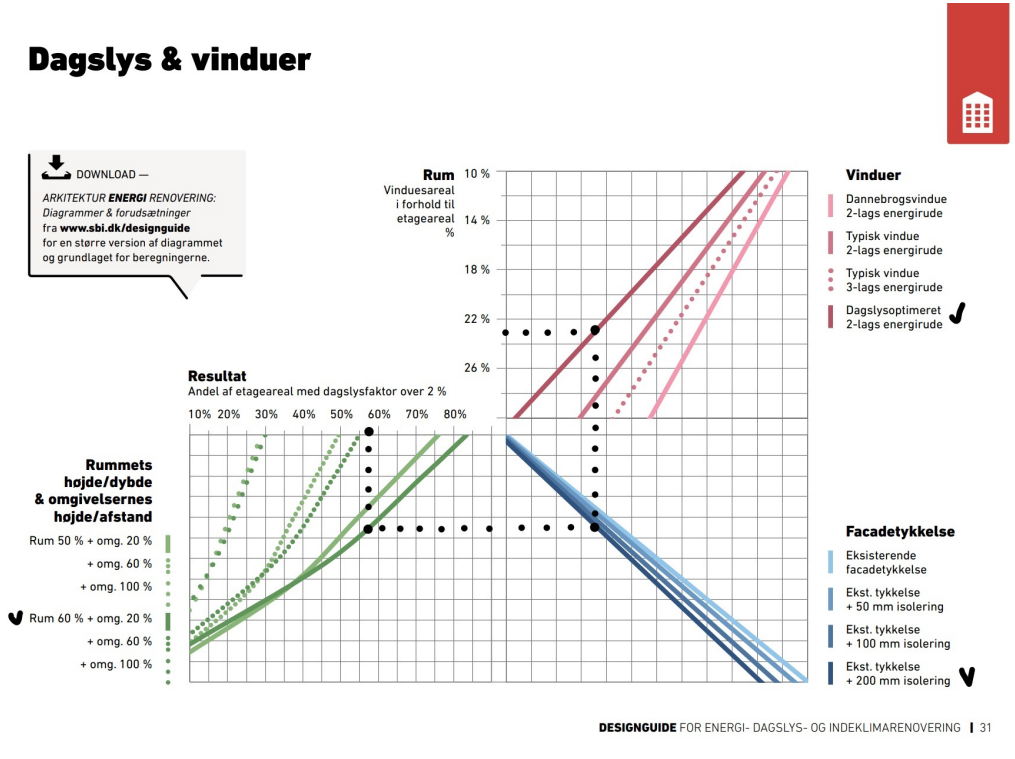
Primary energy consumption



1.2 How glazing parts and their specifications contribute to natural heating and indoor climate?

Daylight

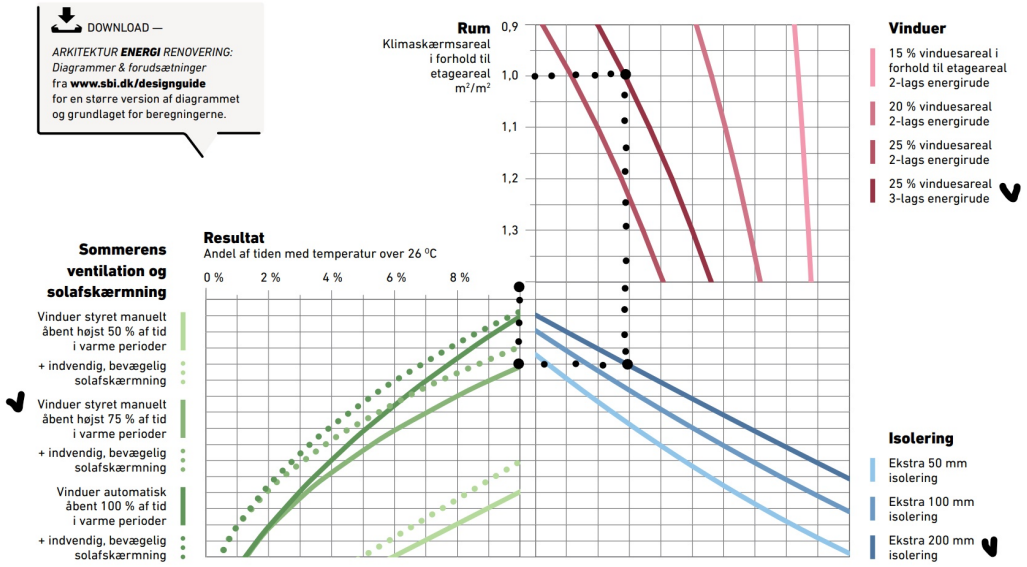




1.3 How glazing parts and their specifications contribute to natural heating and indoor climate?

Thermal comfort

Termisk indeklima



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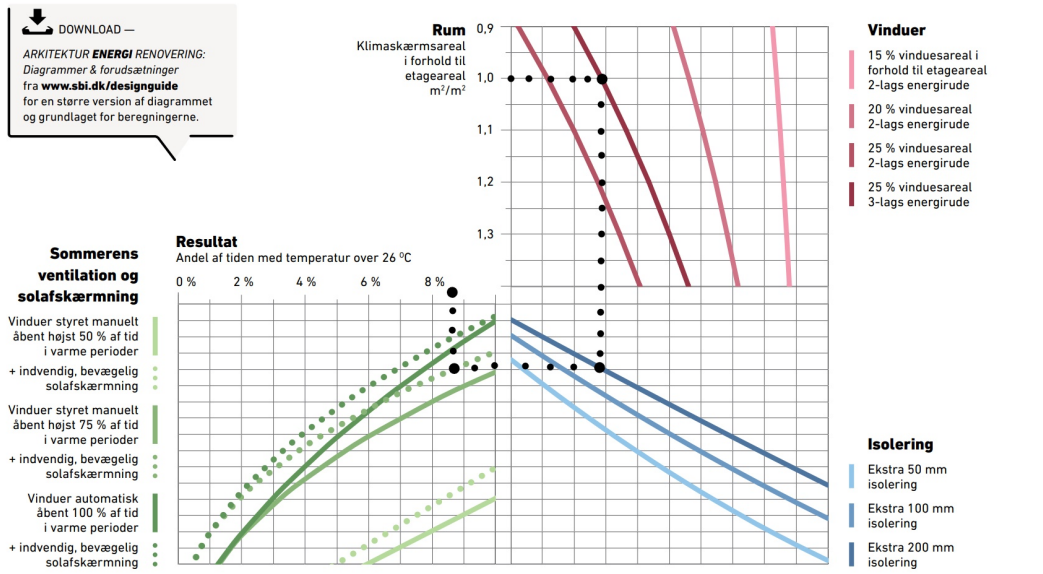
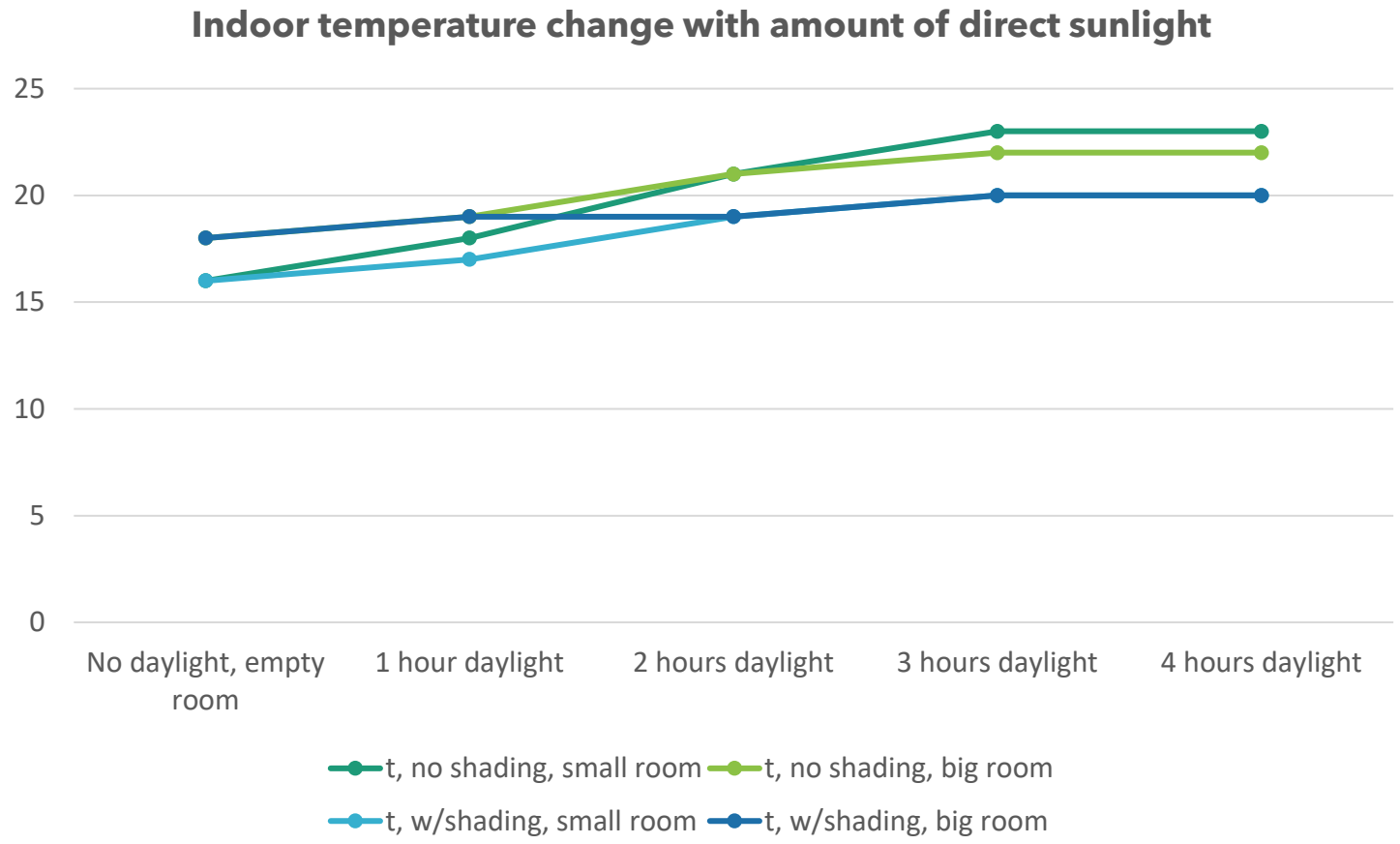


DESIGNGUIDE FOR ENERGI- DAGSLYS- OG INDEKLIMARENOVERING | 33

2.1 Is the problem of overheating relevant to refurbishment of traditional residential buildings in Denmark?

Correlation between amount of daylight and indoor climate, on practice:



2.2 Is the problem of overheating relevant to refurbishment of traditional residential buildings in Denmark?

Interview results:

1. Both work on residential buildings
2. One faced with the problem of overheating
3. Both t.i.c. energy consumption, daylight absorption, orientation and placement of openings
4. Both support individual approach to each cas
5. Both prefer passive measures, passive shading/shading that is created by building m
6. Both consider shading a good investment, if highly necessary
7. Both didn't face with the problem of overheat in new buildings
8. One has Energy Engineer and special program

2. Is the problem of overheating relevant to refurbishment of traditional residential buildings in Denmark?

Conclusions after interview:

a) Refurbishment solves the problem of overheating

b) Passive measures win over mechanical solutions

c) Comprehensive analysis of energy envelope and indoor climate

d) Individual approach to every case

e) Cost- and environmentally-effective solutions prevail and worth investments

3. How to solve the problem of overheating in refurbishment projects?

Type of shading:

Passive, created by building mass

Advantages:

- Cost-efficient
- Permanent
- Sustainable

Disadvantages:

- Inadequate amount of shading
- Inability to create the shading
- Inability to place the windows in the most advantageous position

3. How to solve the problem of overheating in refurbishment projects?

Type of shading:

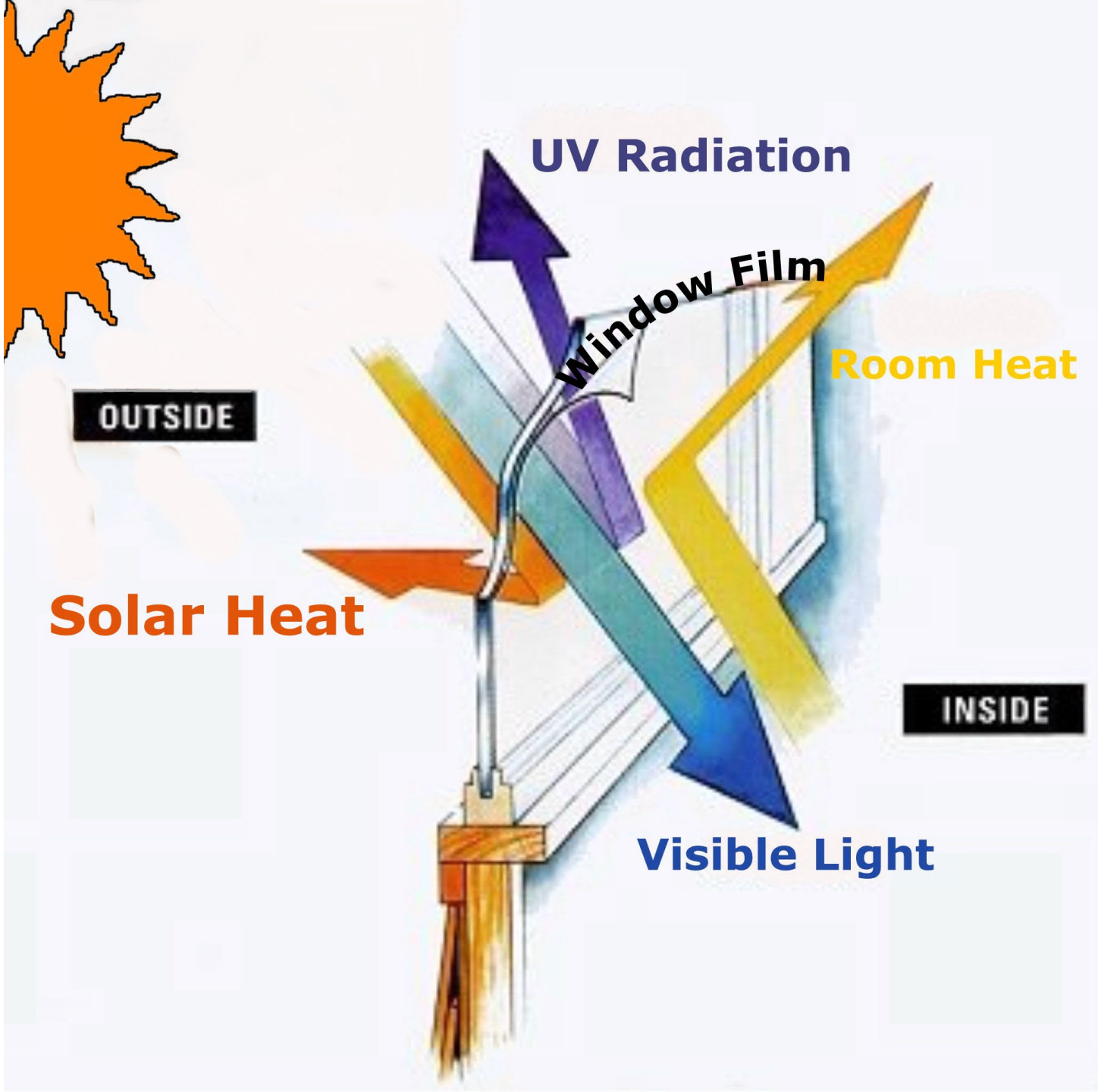
Windows with solar protection films or coating

Advantages:

- Reduces glare
- Blocks near 99% of UV radiation and near 55% of heat
- Preserves as much daylight as possible

Disadvantages:

- More expensive
- Not efficient for colder climates



3. How to solve the problem of overheating in refurbishment projects?

Type of shading:

Indoor manual (blinds, curtains, etc)

Advantages:

- Fast and easy to install and maintain
- Low price
- Variety
- Additional privacy

Disadvantages:

- Manual adjustment
- Hard to maintain balance between lighting and thermal comfort
- Regular maintenance

3. How to solve the problem of overheating in refurbishment projects?

Type of shading:

Static outdoor (overhang, fins, blades, etc.)

Advantages:

- Well-designed reduces heat gains
- Improves quality of lighting and visual comfort

Disadvantages:

- Sometimes hard to calculate
- Some types are useless in winter, in the evening and in the morning
- Highly stylized

3. How to solve the problem of overheating in refurbishment projects?

Type of shading:

Outdoor motorized shading

Advantages:

- Doesn’t require inhabitants’ involvement
- Maximizes indoor space
- Adds privacy
- Variety

Disadvantages:

- Reduced visibility
- Maintenance by specialist
- Motor failure due to outdoor obstacles
- Distracting sound
- Not common for residential buildings

Second and final conclusion

- Relevance to the topic
- Meaning of daylight
- Approach and solutions

Thank you for your attention!