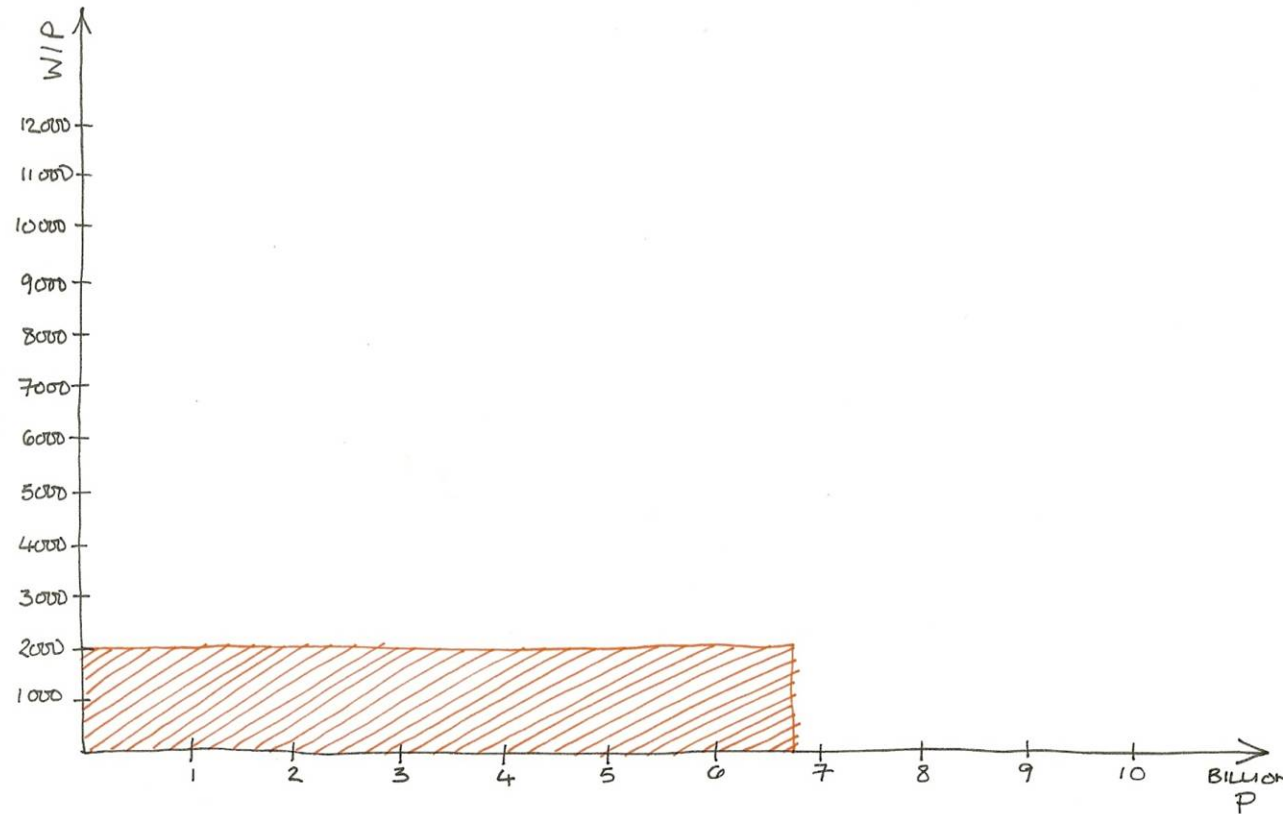




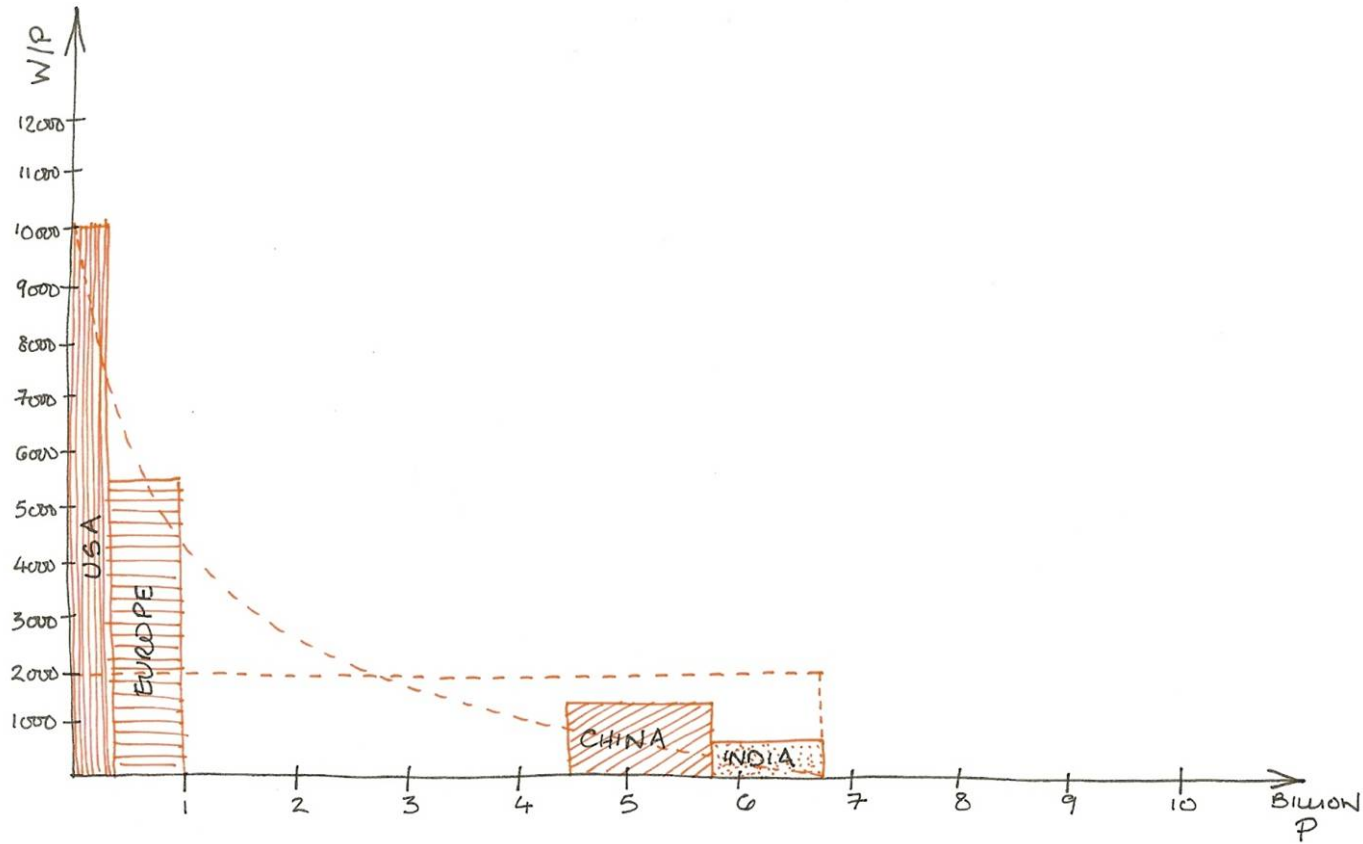
prof. brian cody - vienna - 17.11.2009



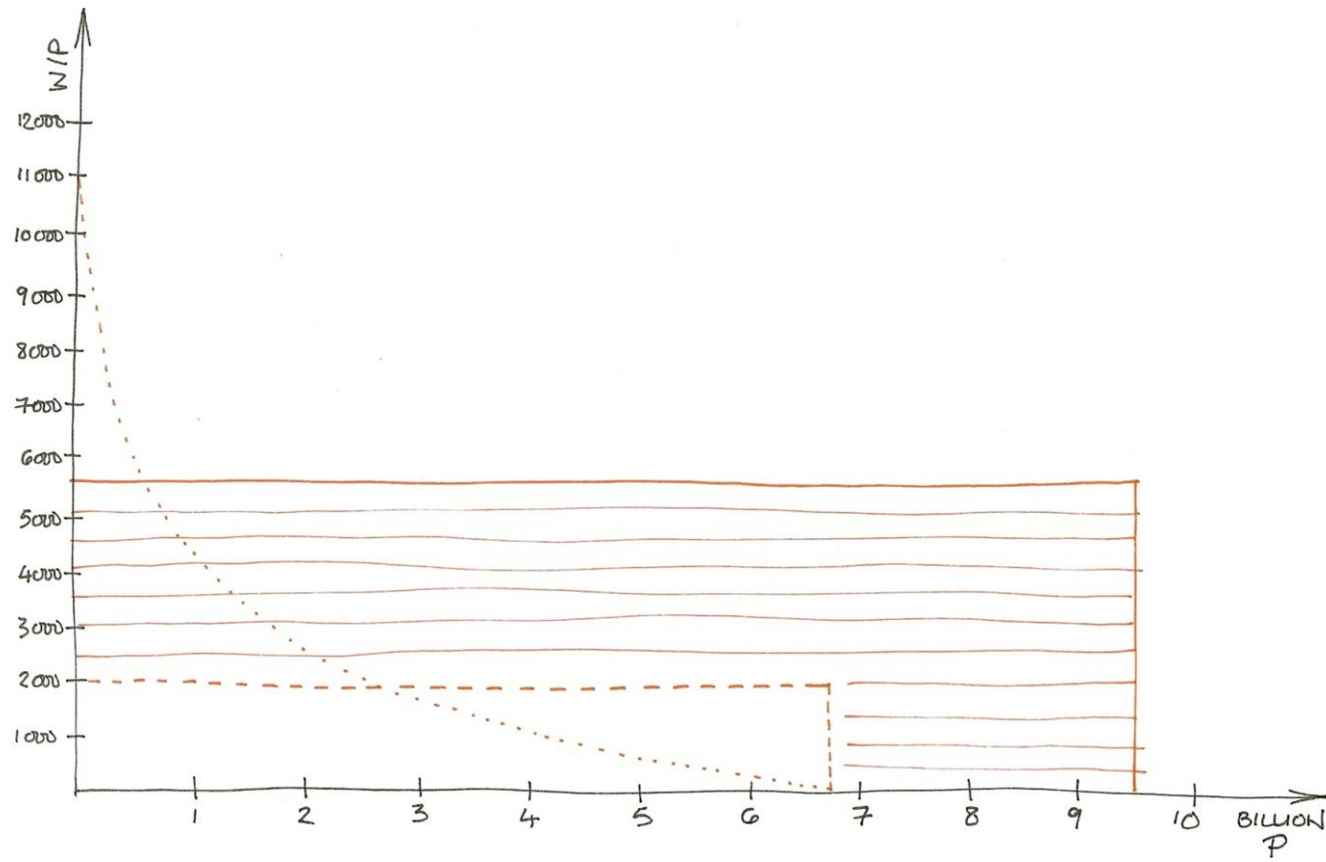
world energy consumption - c. 450 EJ



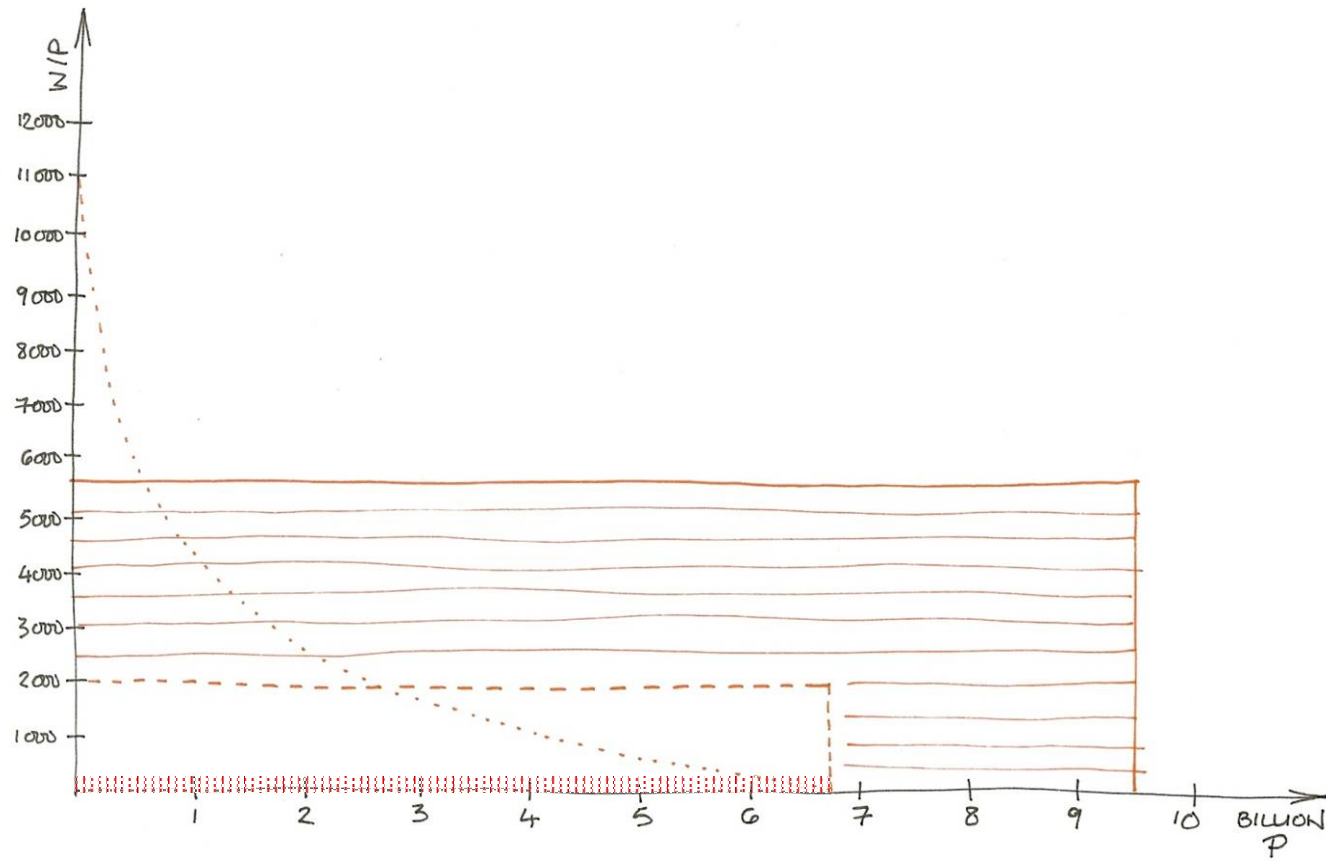
world energy consumption - c. 450 EJ



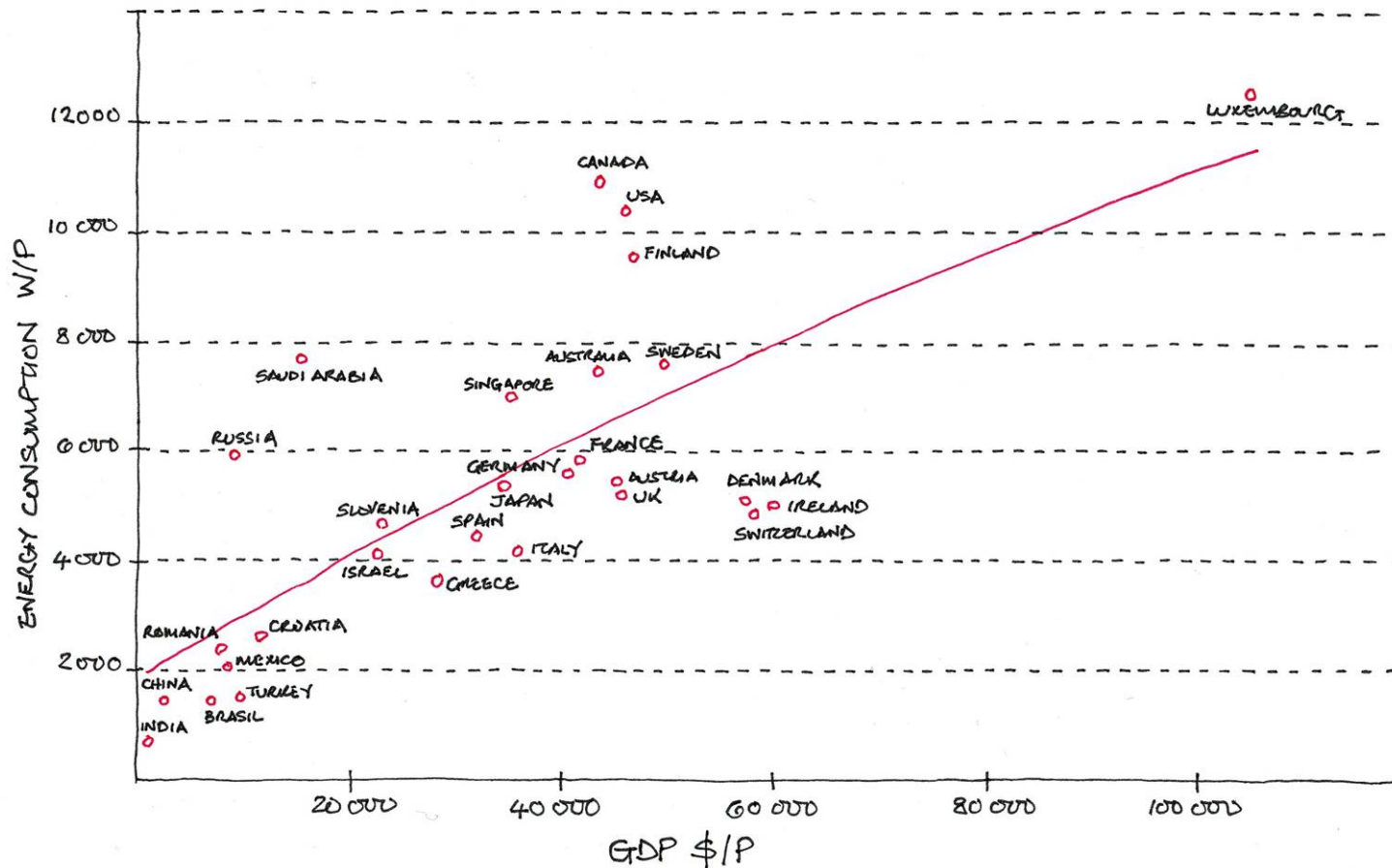
world energy consumption 2050 - c.1700 EJ (shell prediction for 2050 c.1350 EJ)



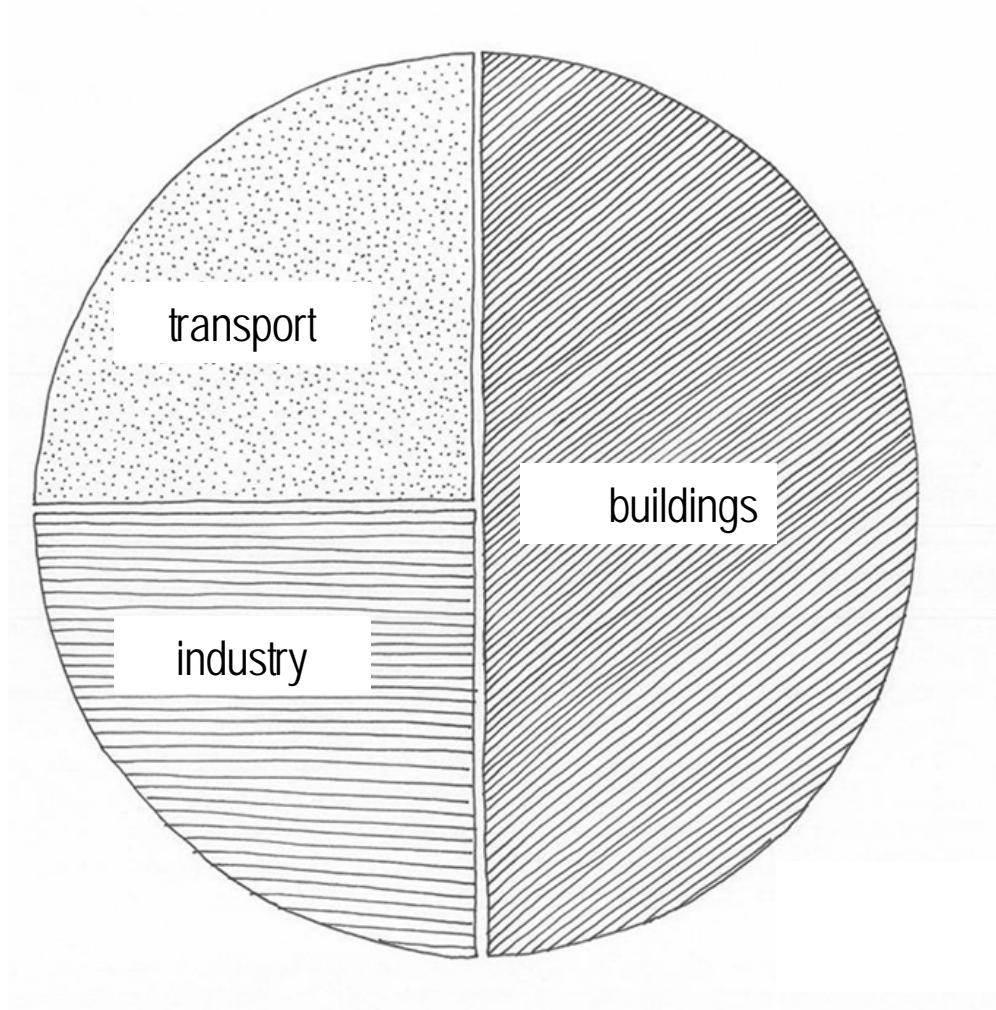
world energy consumption 2050 - c.1700 EJ (shell prediction for 2050 c.1350 EJ)



correlation between economic productivity and energy consumption for various countries

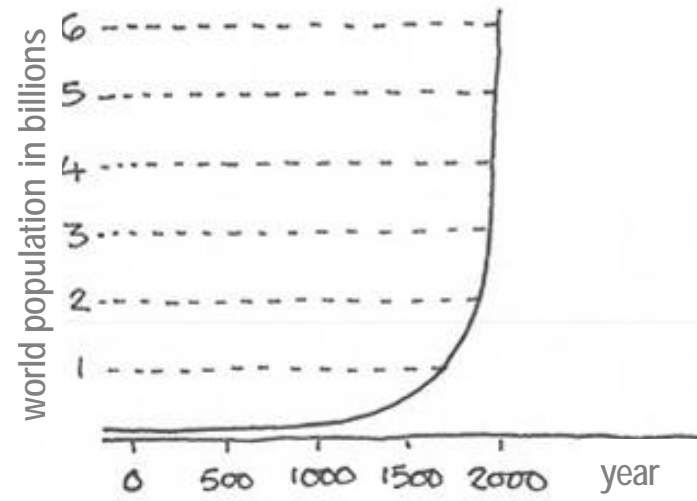


buildings accountable for 50% of world energy demand





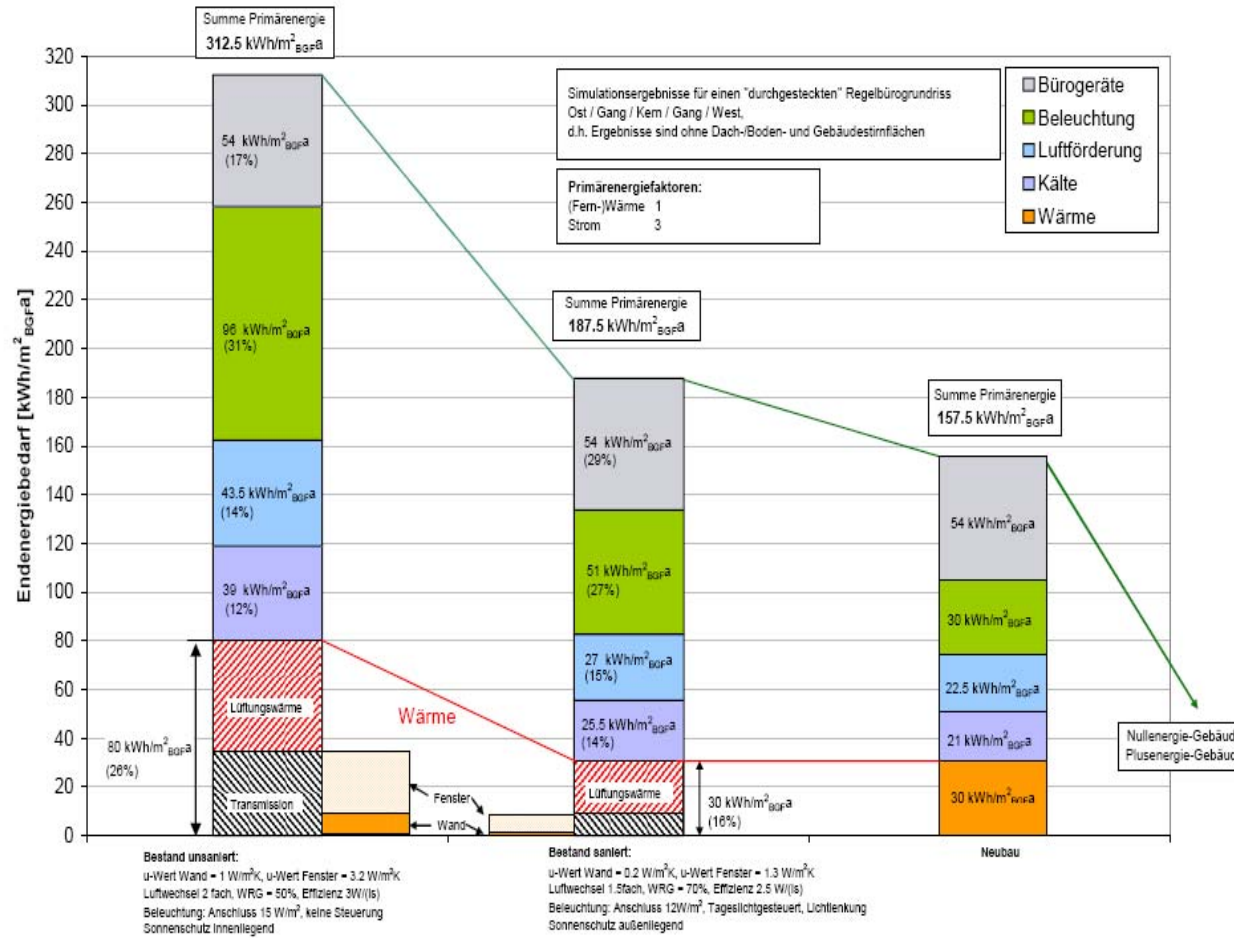
worldwide population growth c. 250 000 people per day



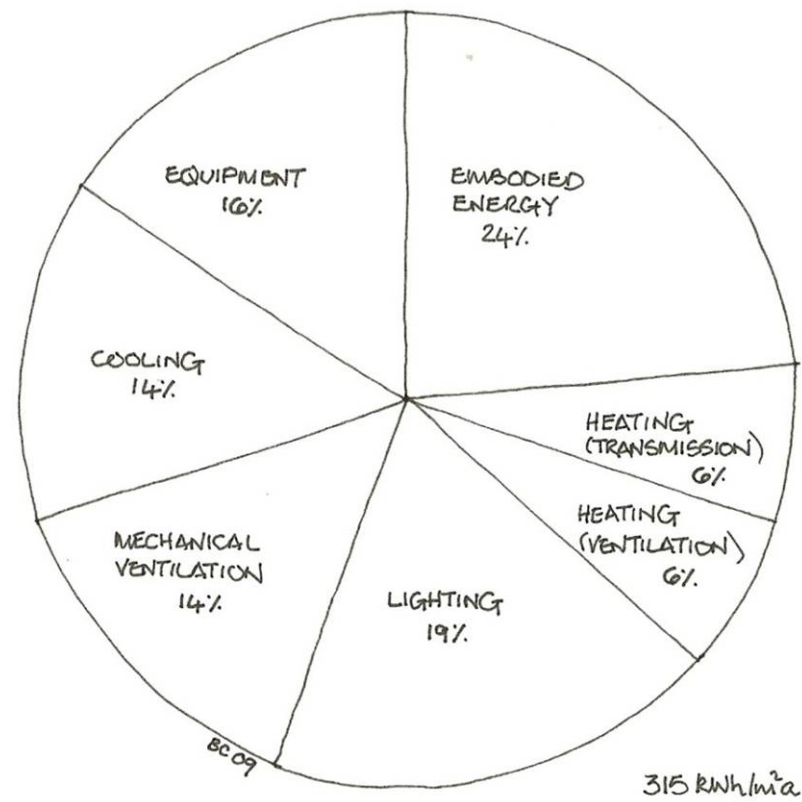


competition stwegg steg graz - research at the institute for buildings and energy, tu graz



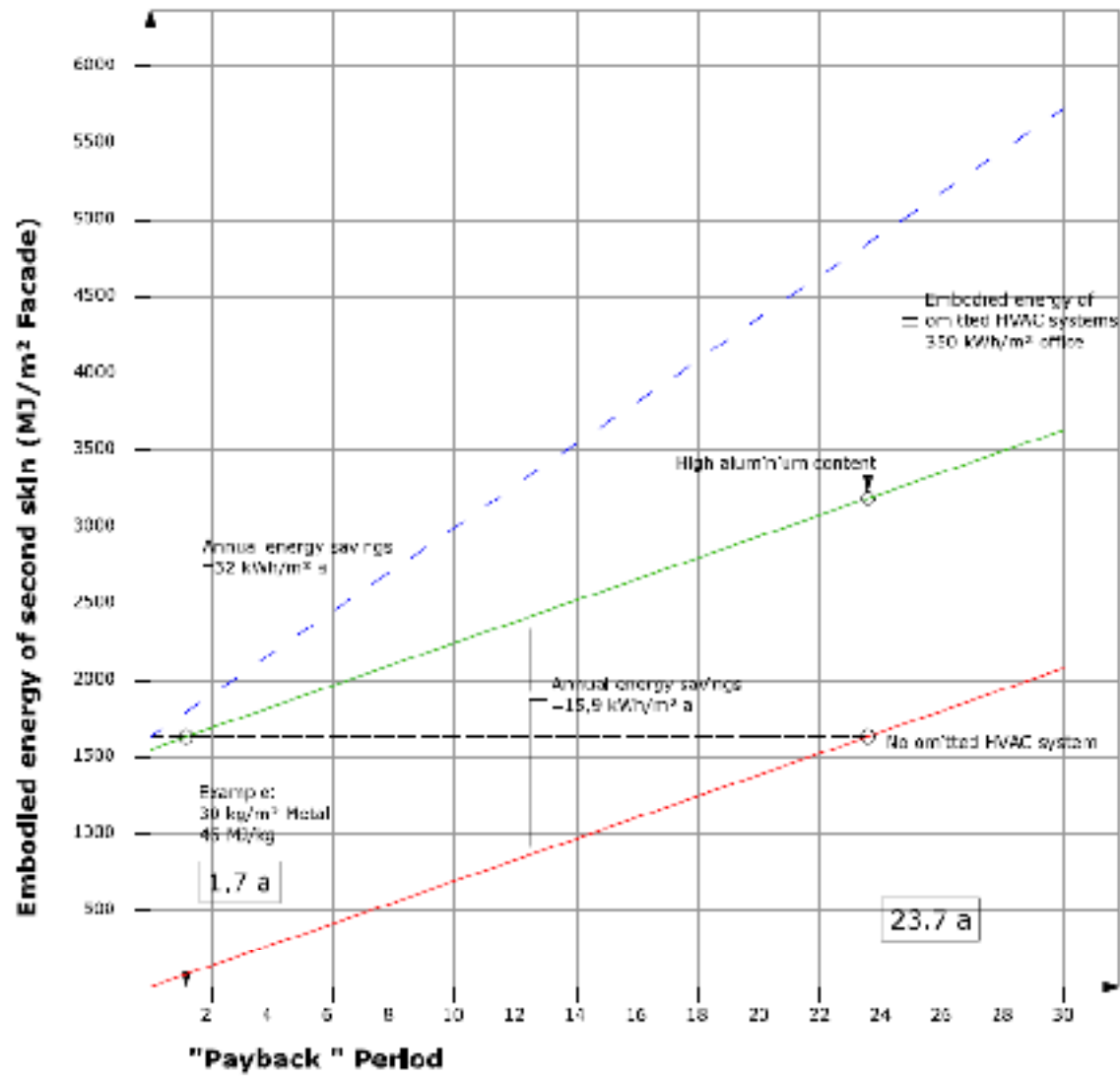


total primary energy demand of a typical new-build office building

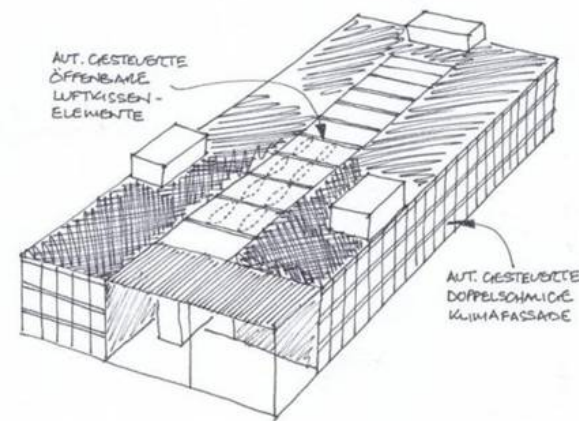




embodied energy of double skin facades - research at the institute for buildings and energy

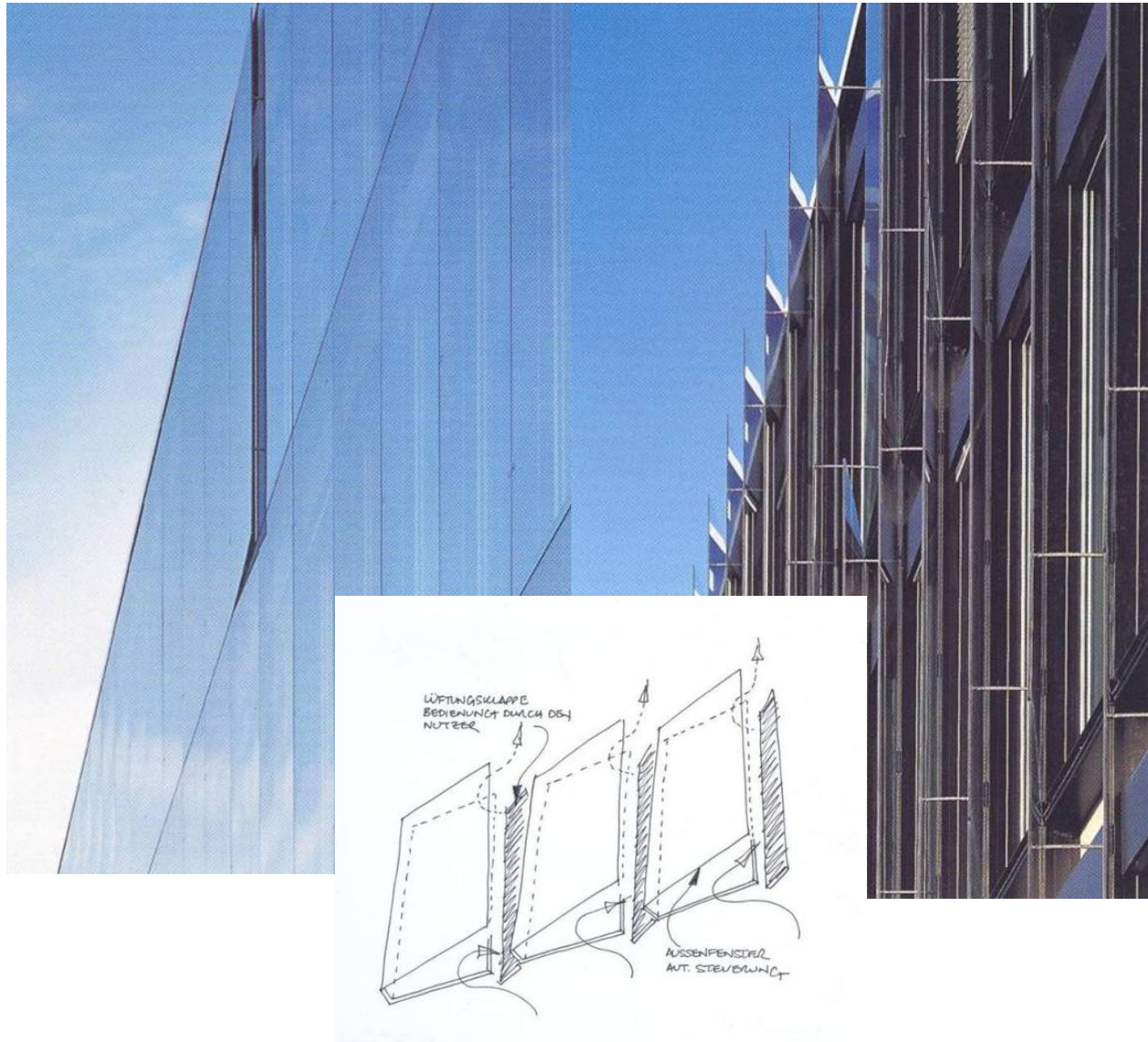


braun hq building, kronberg, germany - schneider + schumacher, arup

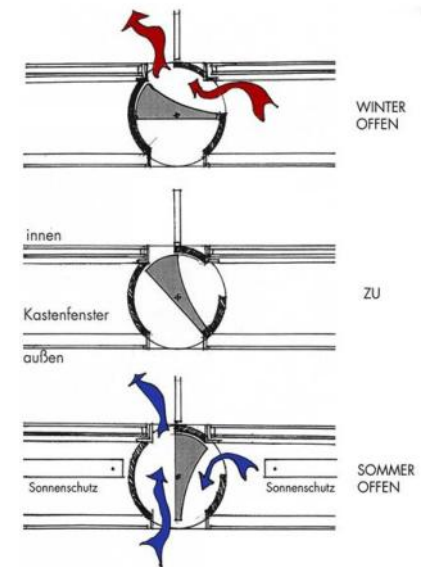




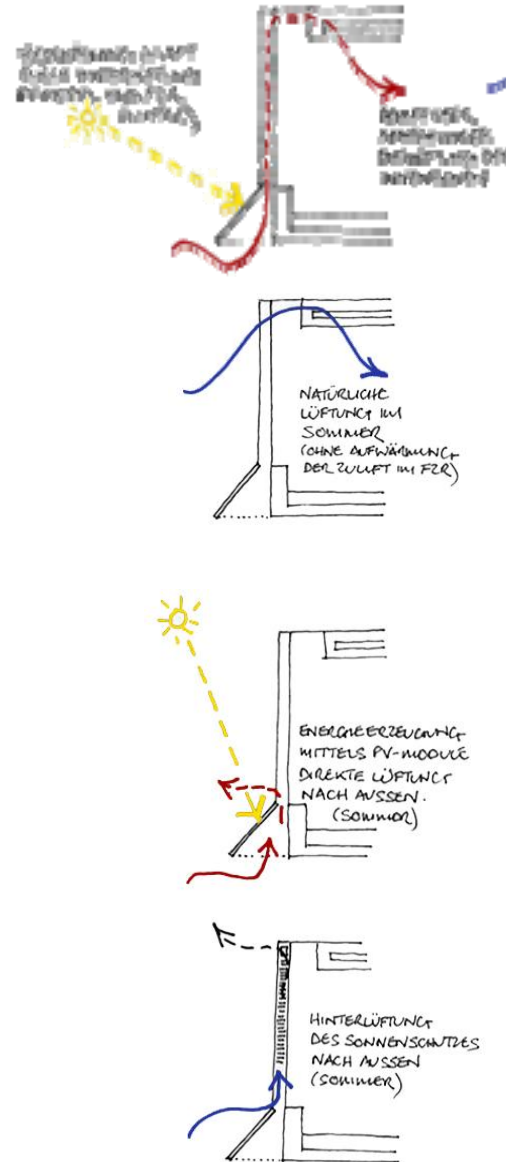
braun hq building, kronberg, germany - schneider + schumacher, arup



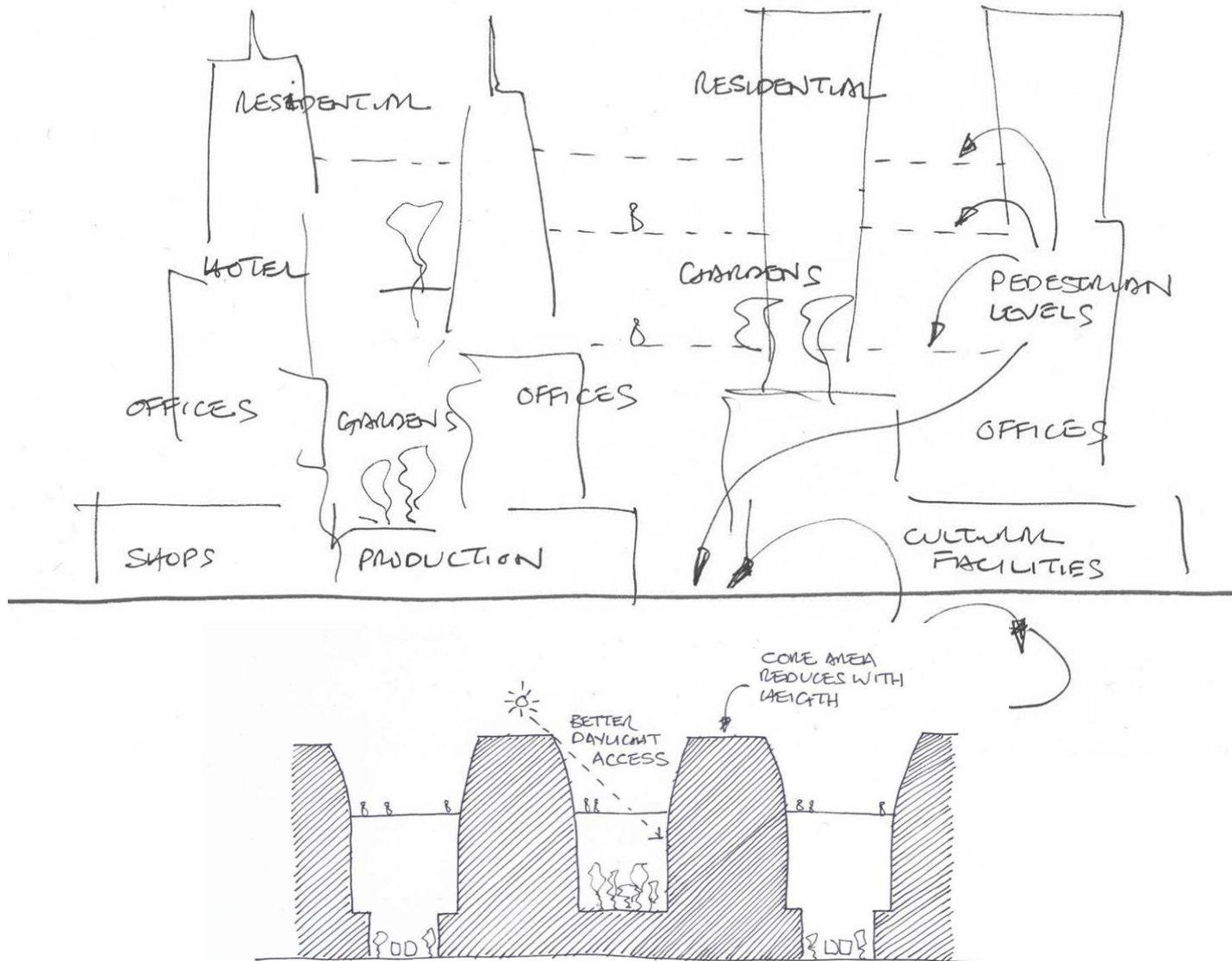
fronius building, wels, austria, architecture schneider + schumacher, engineering arup



*Fronius Forme 14.09.2006*



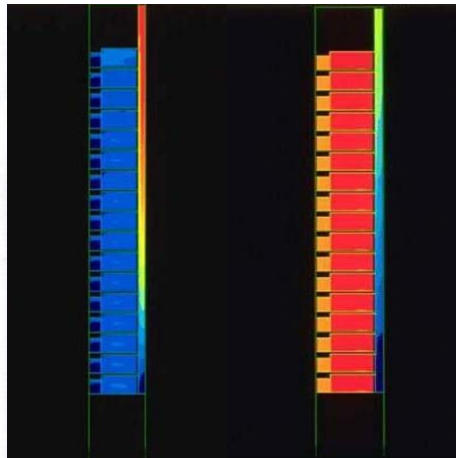
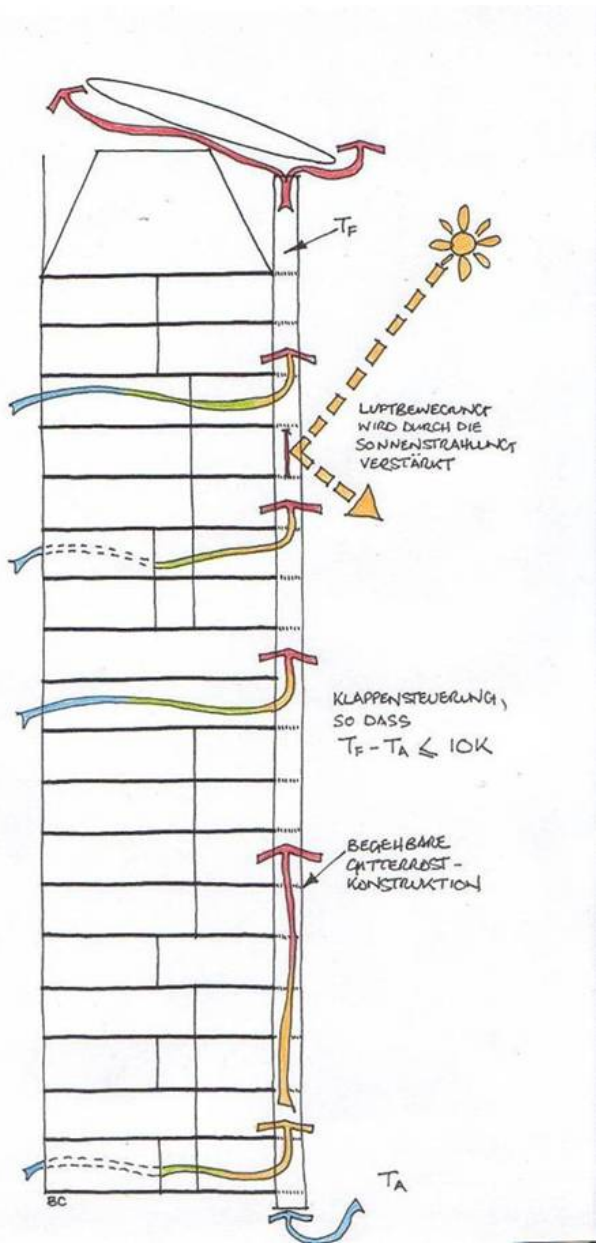
possible contribution of tall buildings to sustainable city development



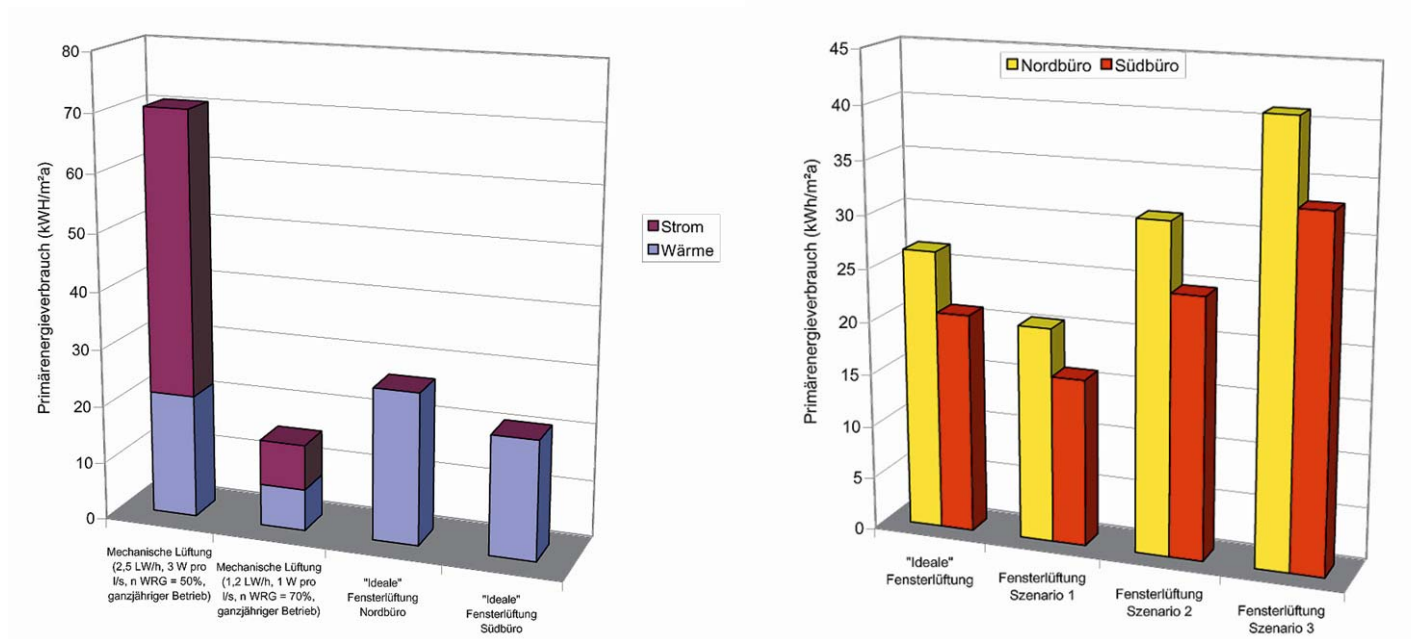
tall buildings and energy efficiency



natural ventilated tall building - gsw hq building, berlin - sauerbruch hutton, arup



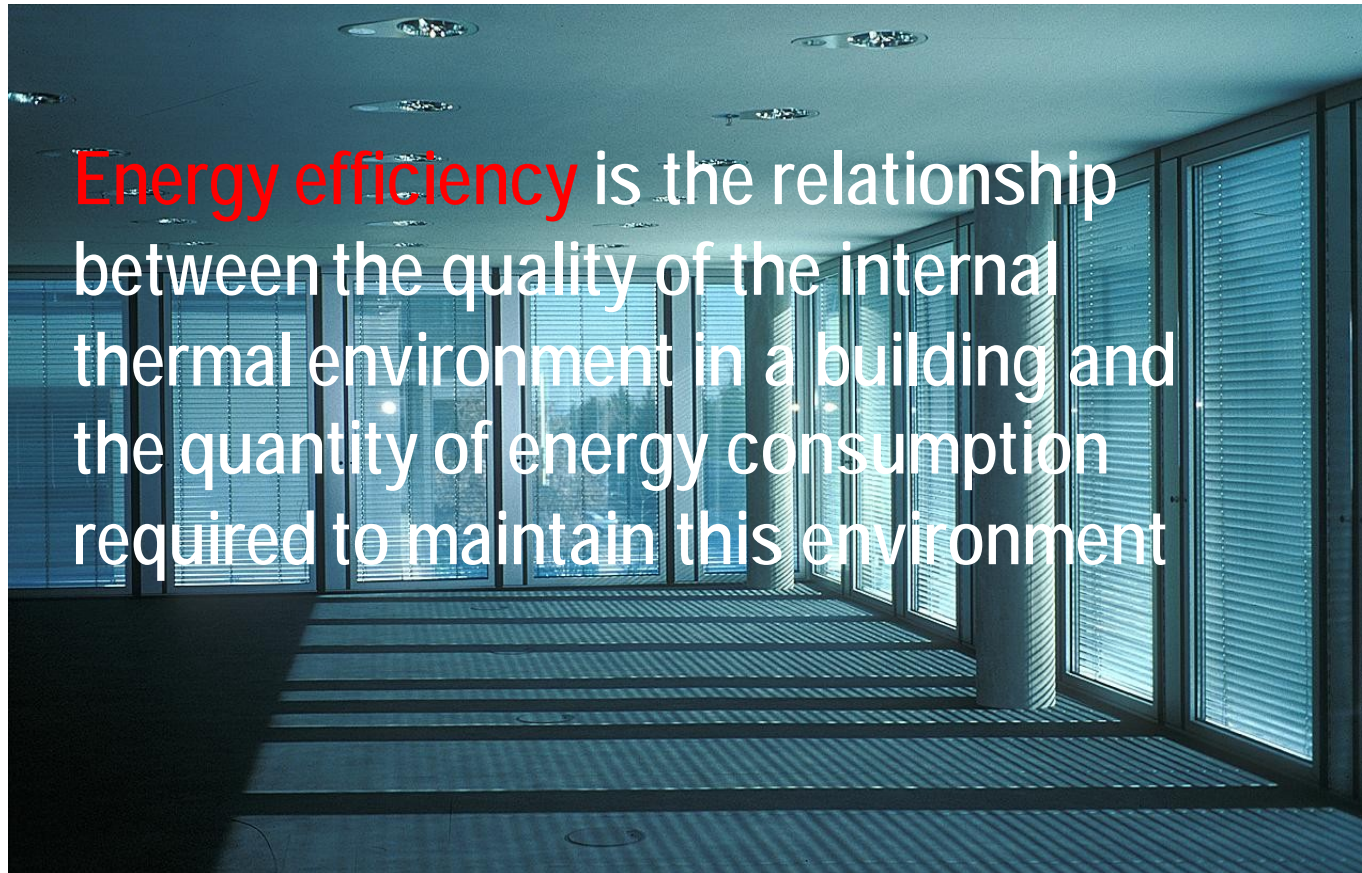




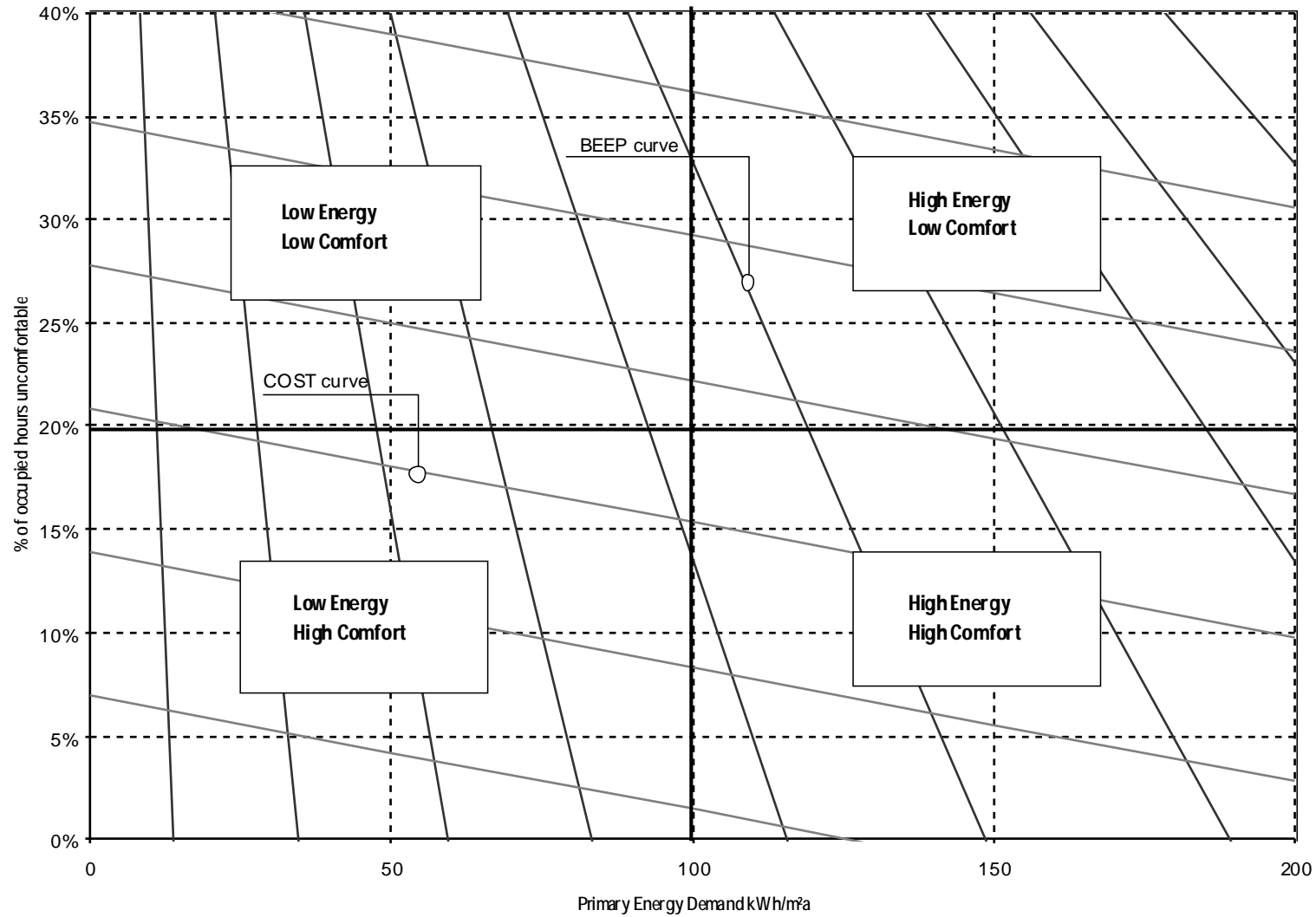


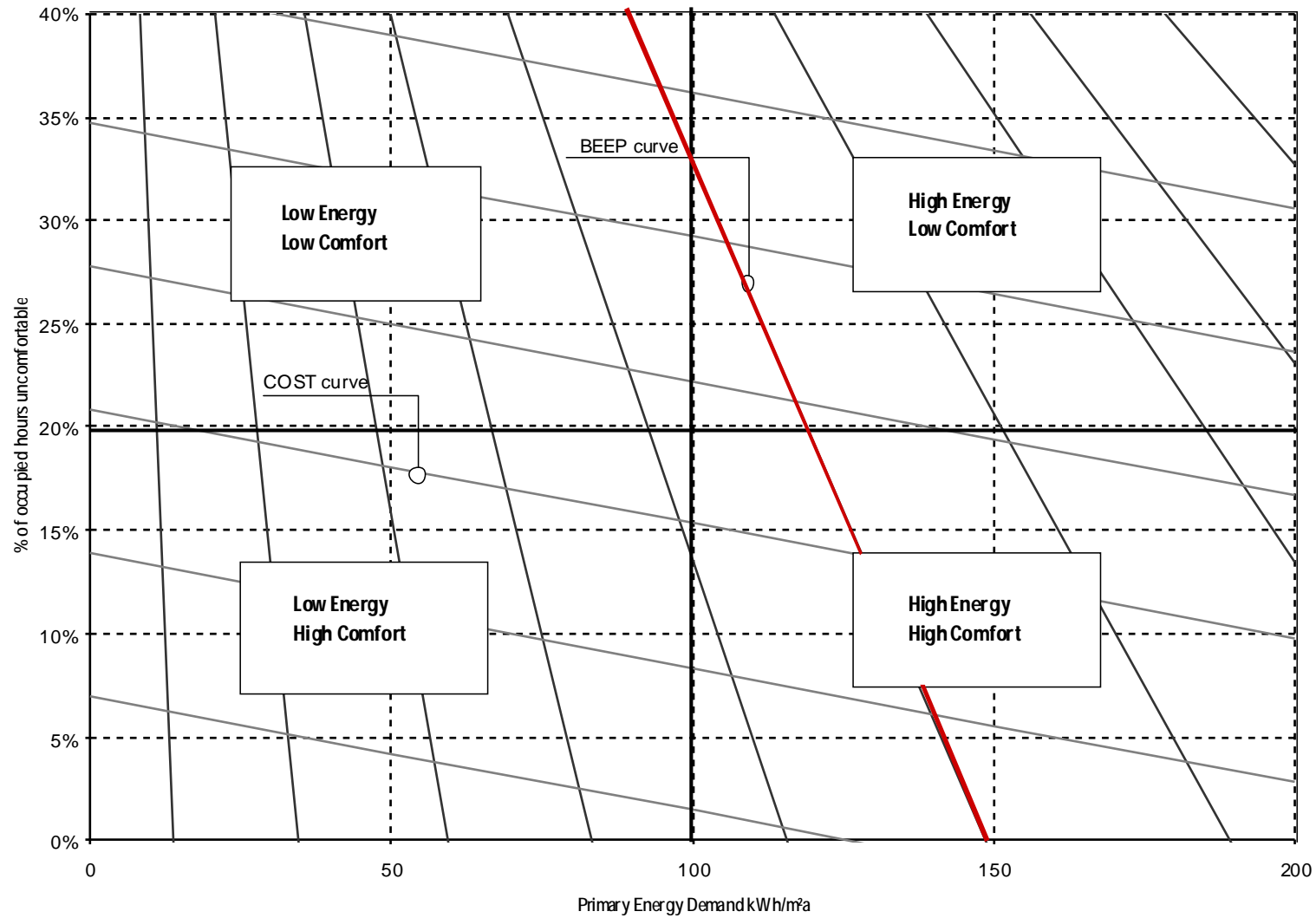


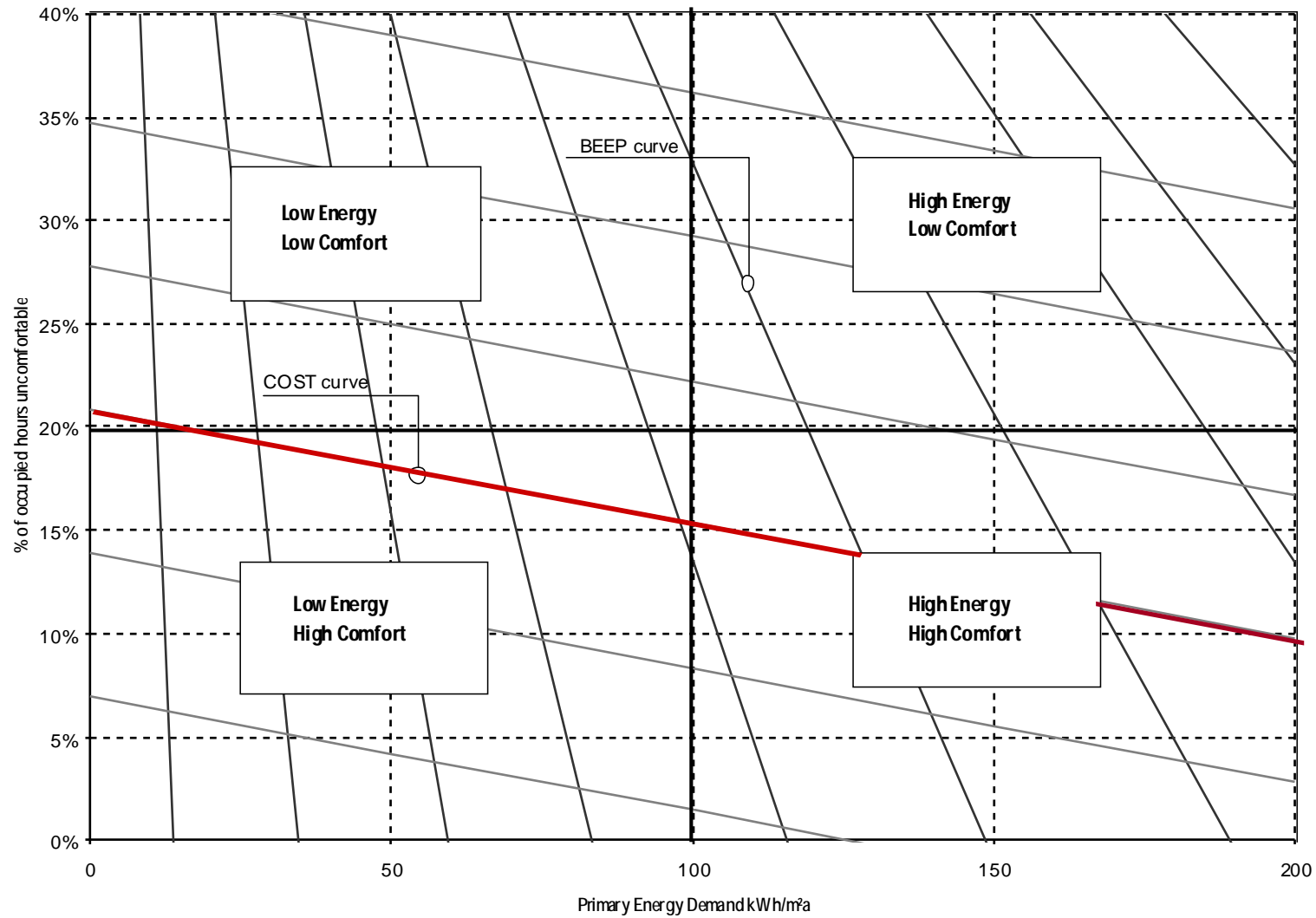
definition of energy efficiency in a thermal building context



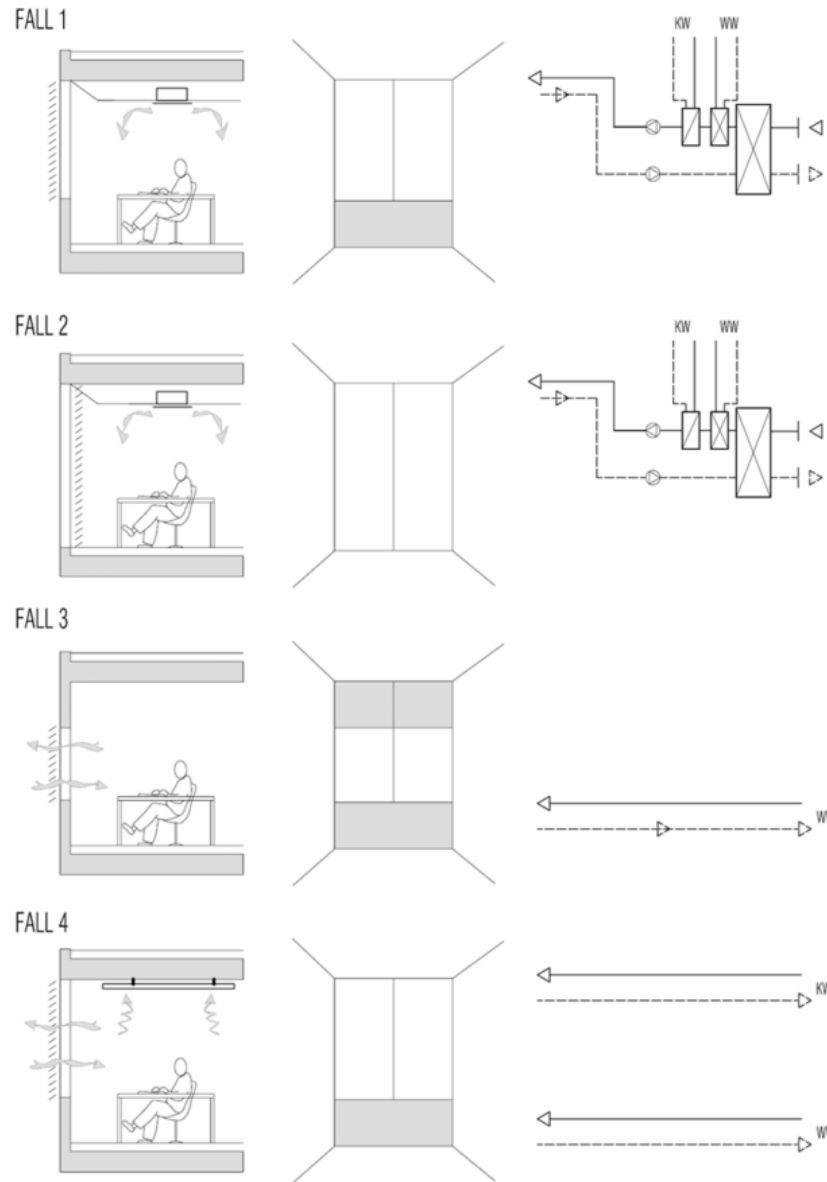
**Energy efficiency** is the relationship between the quality of the internal thermal environment in a building and the quantity of energy consumption required to maintain this environment



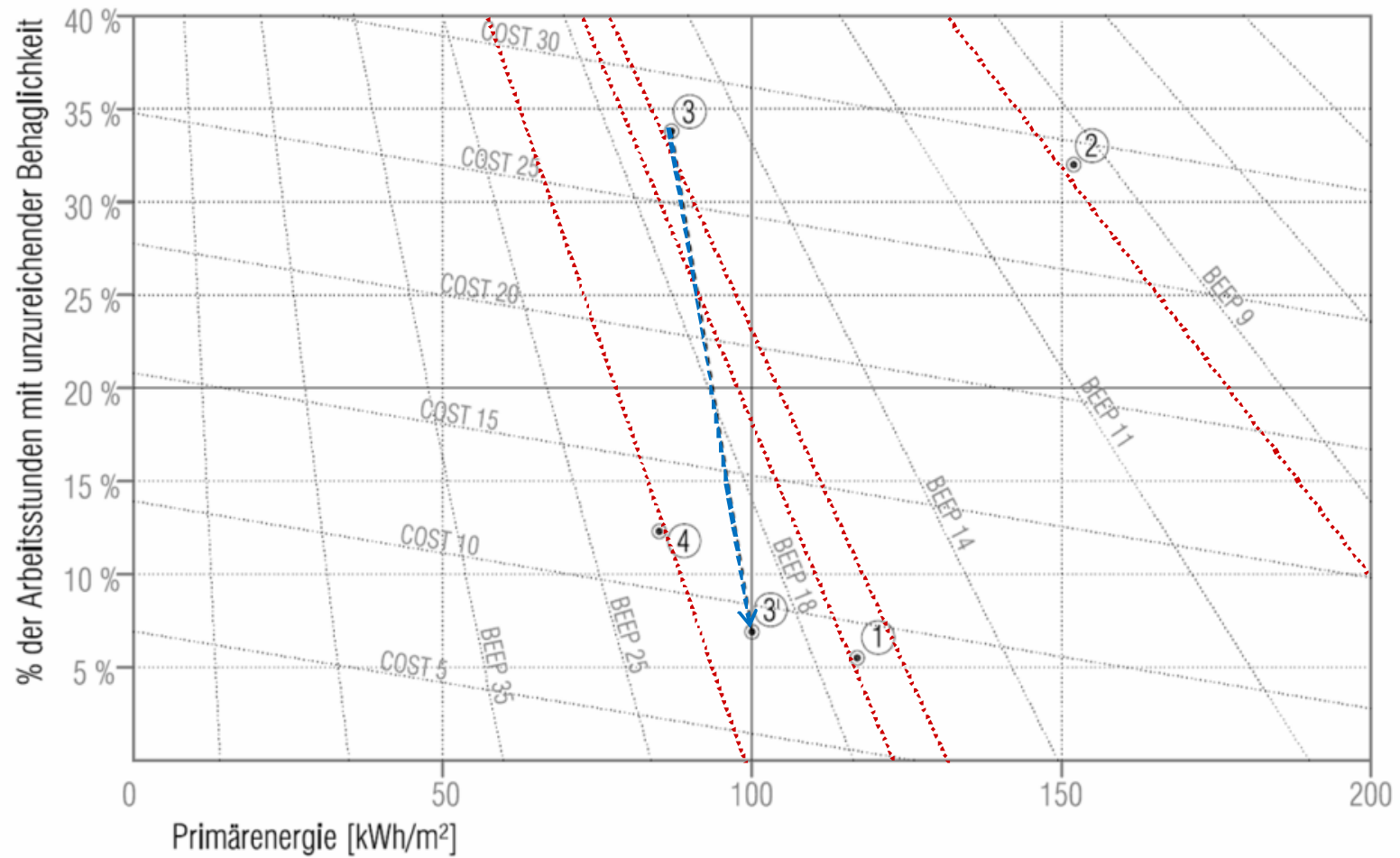




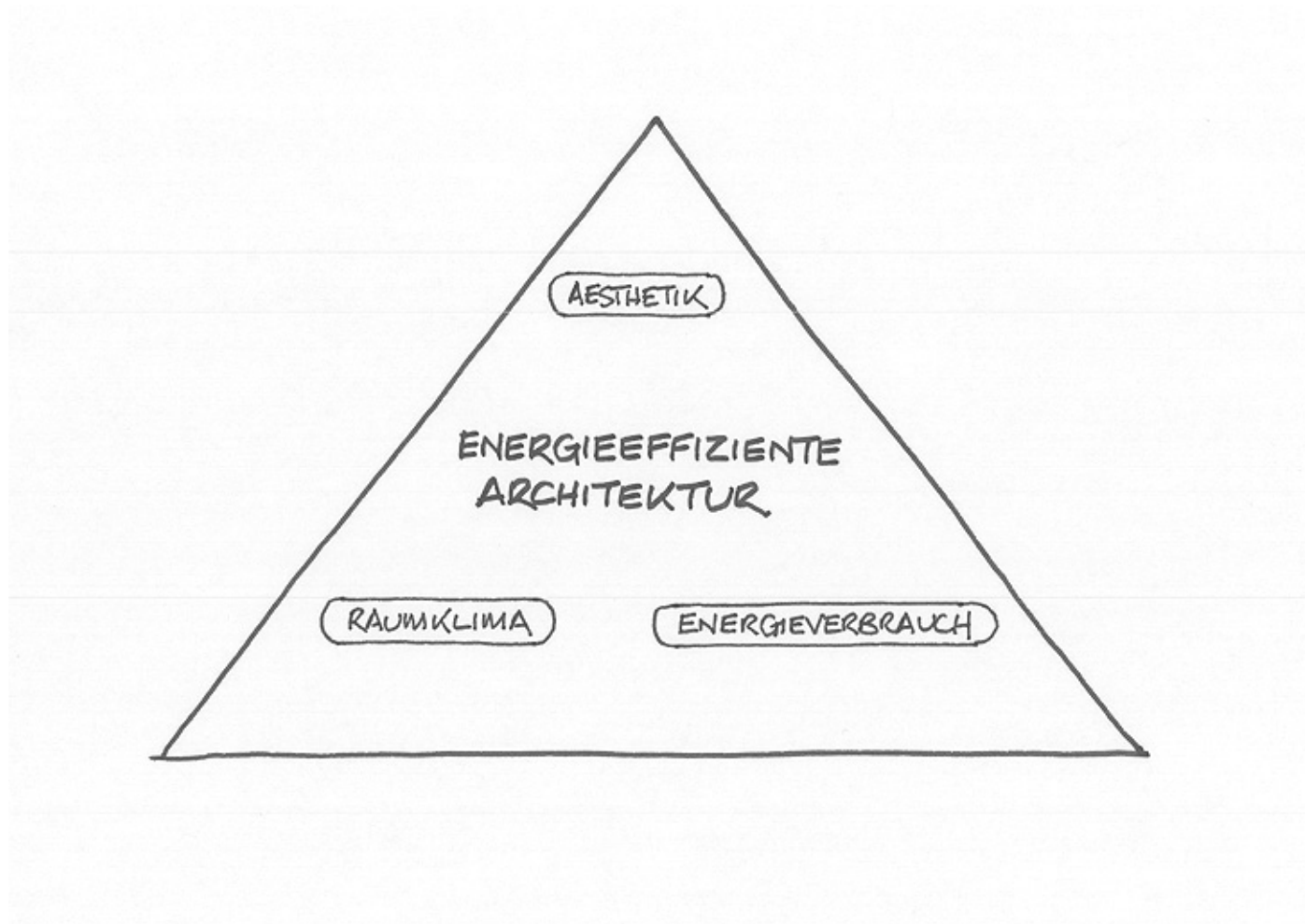
beep - case studies



beep - case studie results



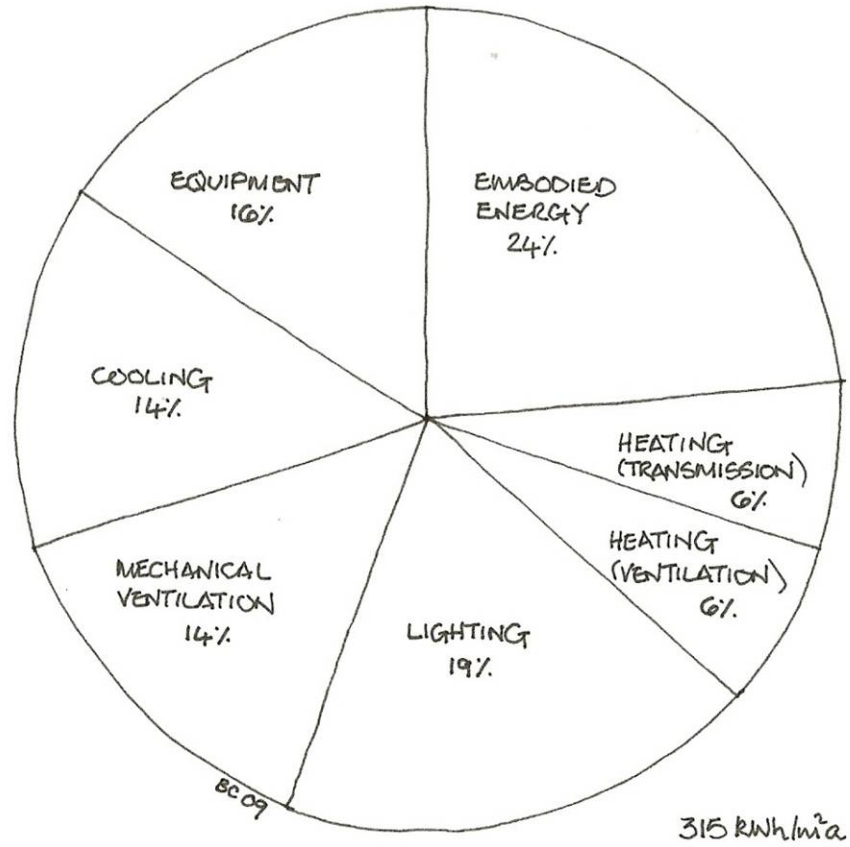
energy efficient architecture



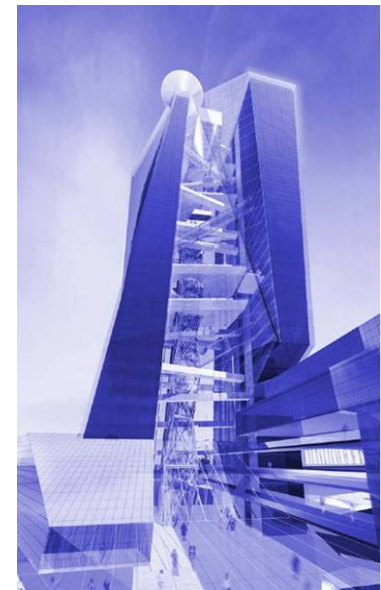
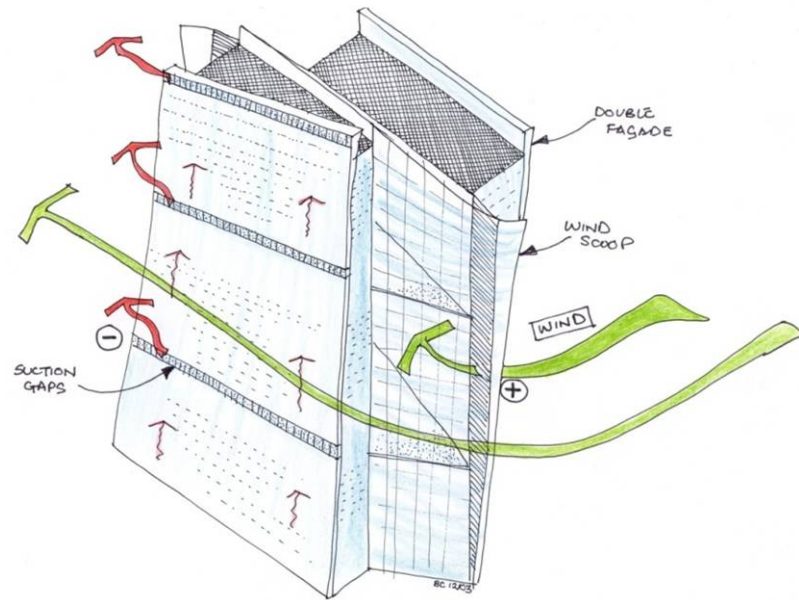


increasing building energy efficiency

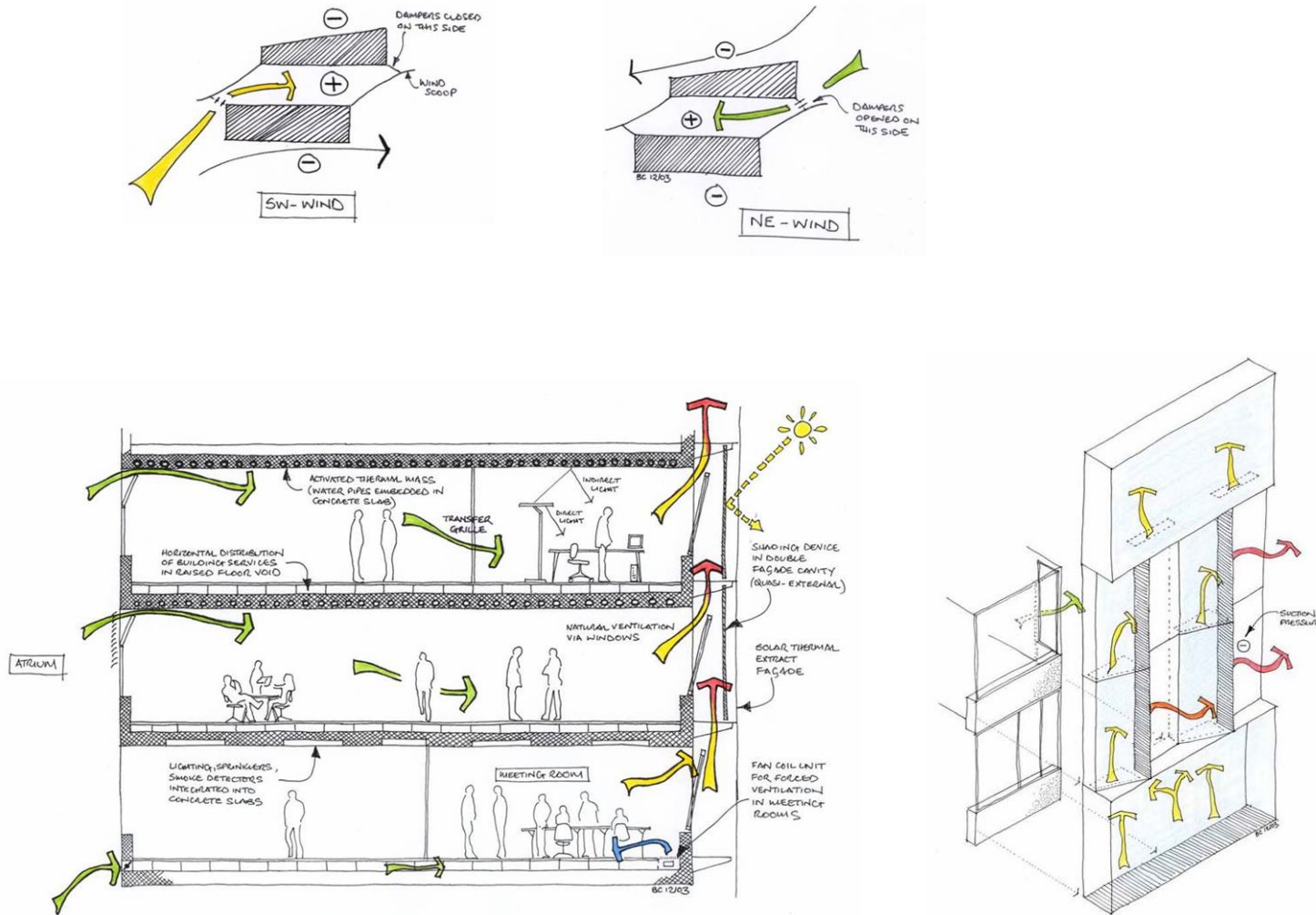
total energy demand of a typical new-build office building



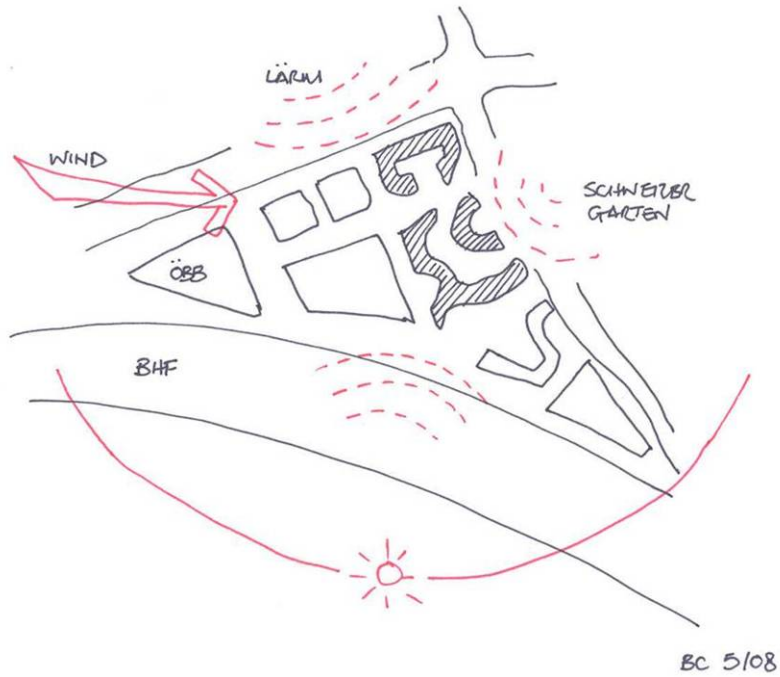
european central bank hq - coop himmelblau, arup - natural ventilation of a skyscraper



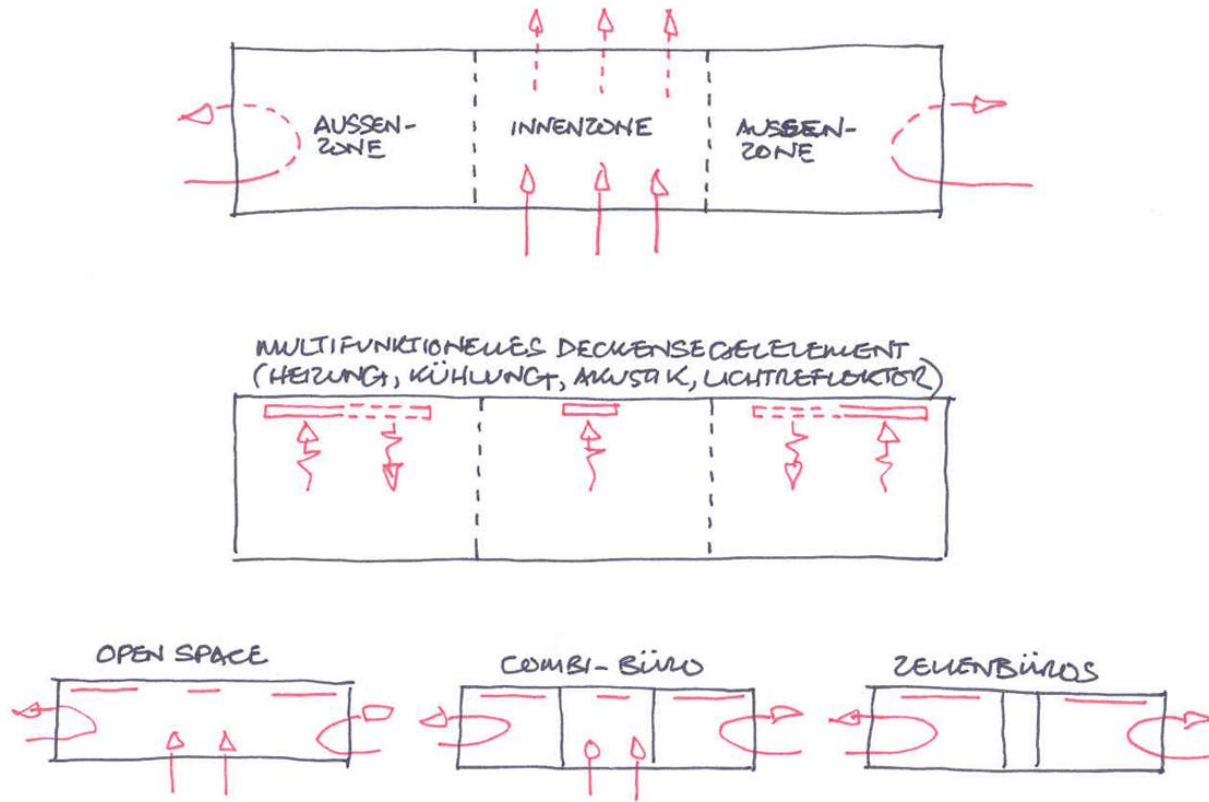
european central bank hq - coop himmellaub, arup - natural ventilation of a skyscraper



erste campus vienna - henke schrieck, arup - hybrid ventilation systems

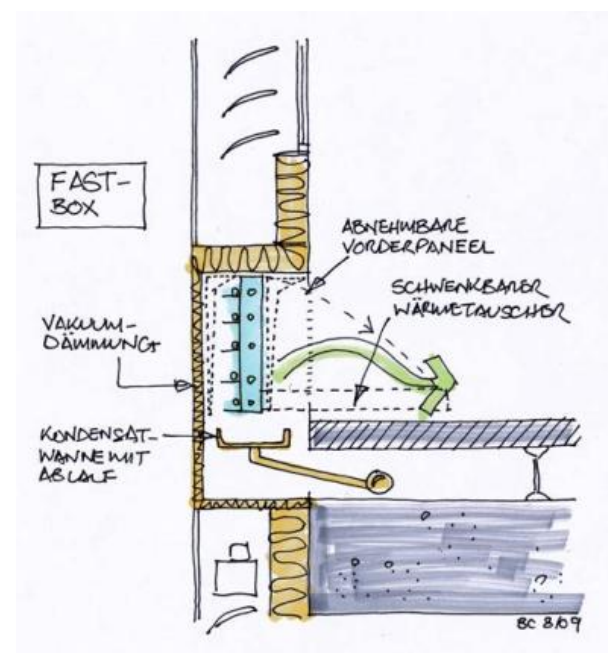
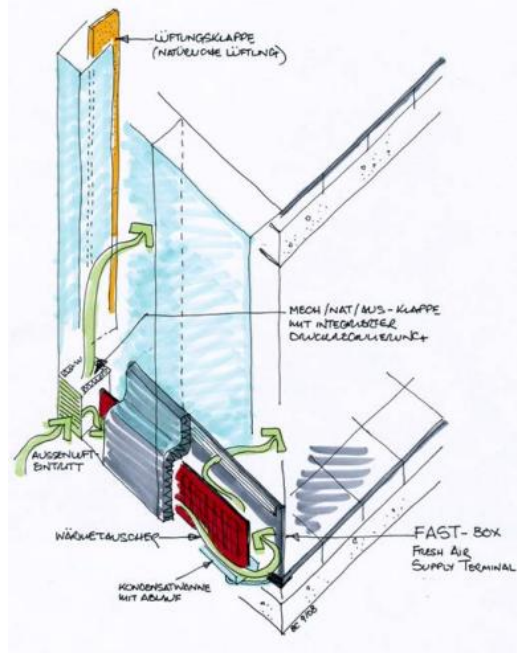
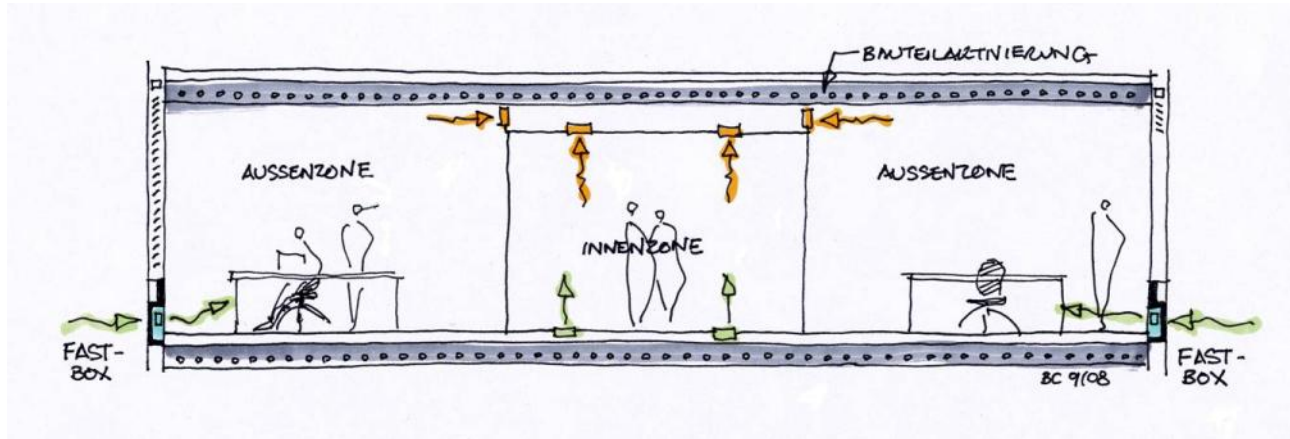


erste campus vienna - henke schreieck, arup - hybrid ventilation systems

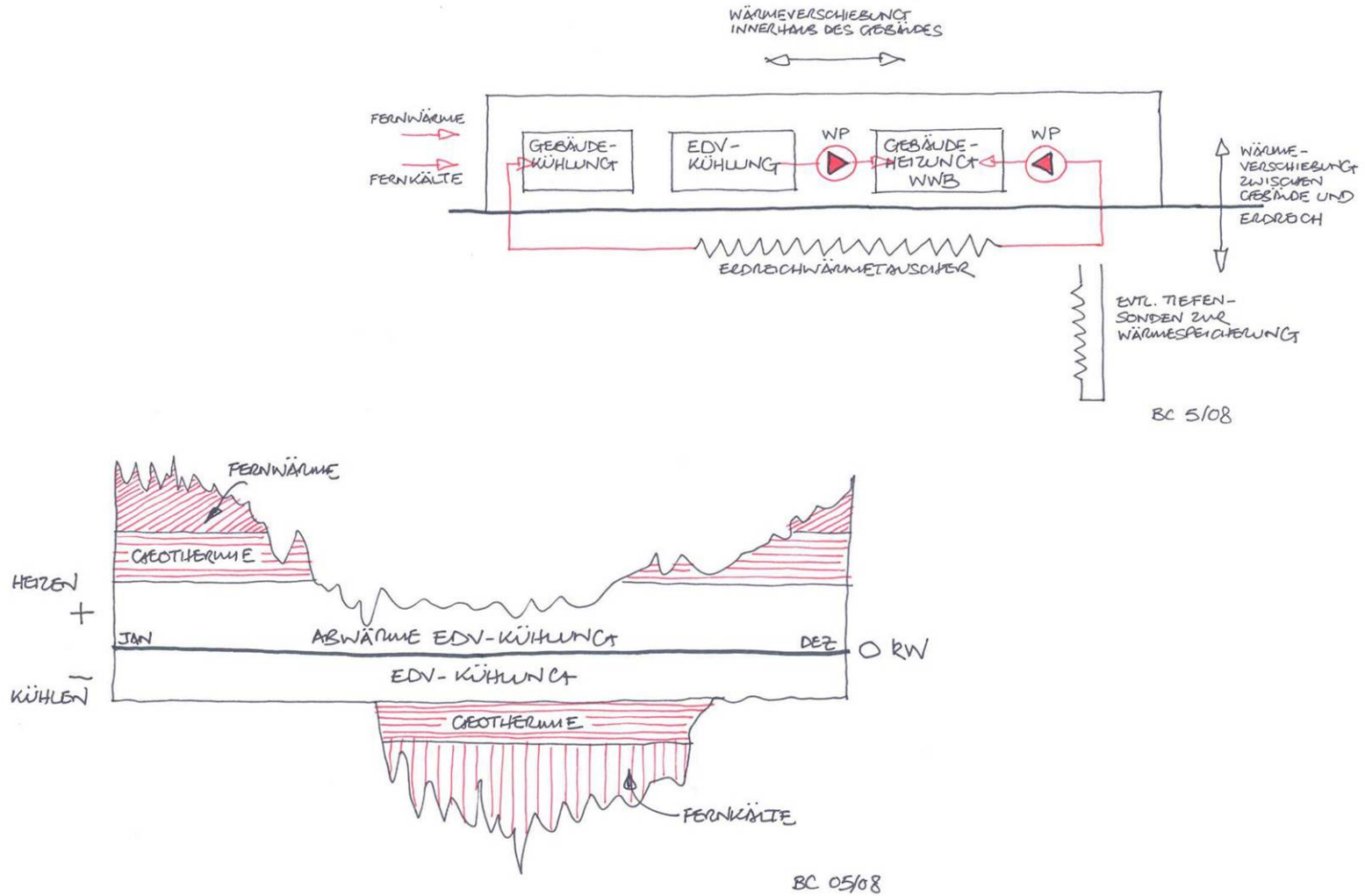


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FAST-box - fresh air supply terminal

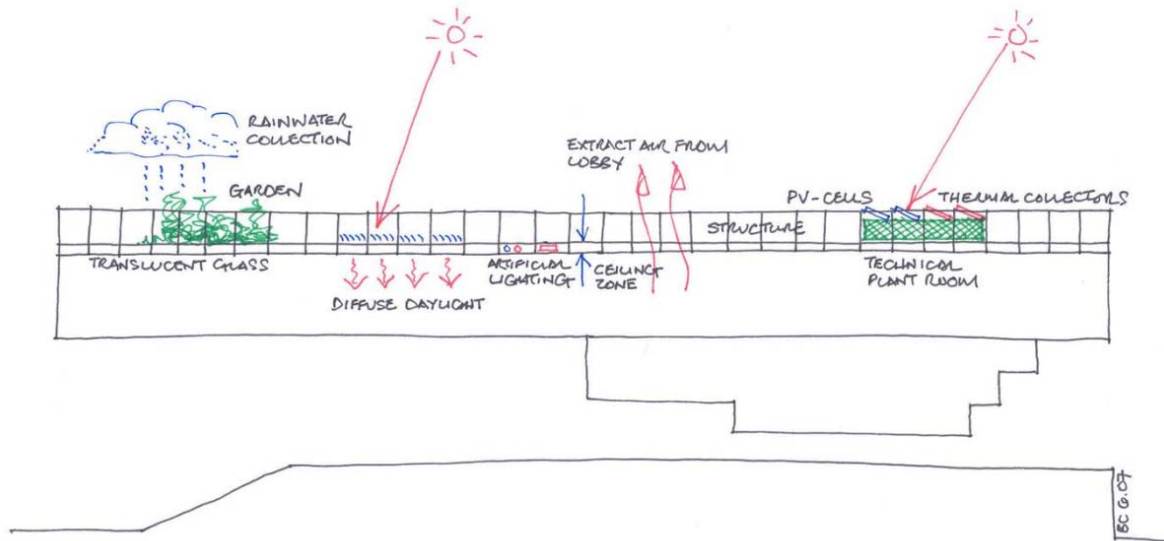


erste campus vienna - henke schreck, arup - energy supply systems

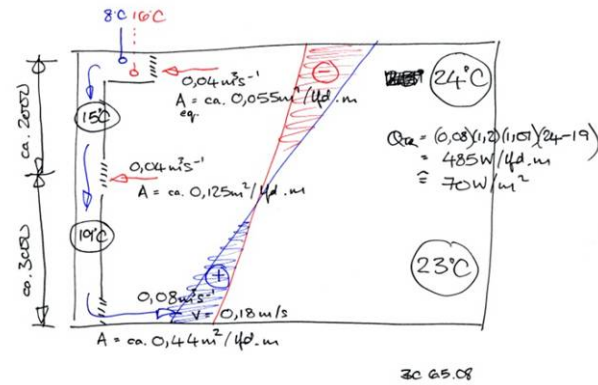
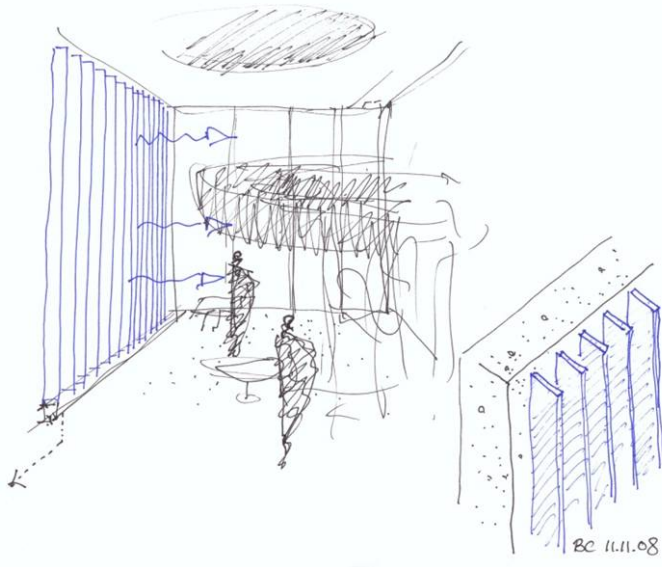
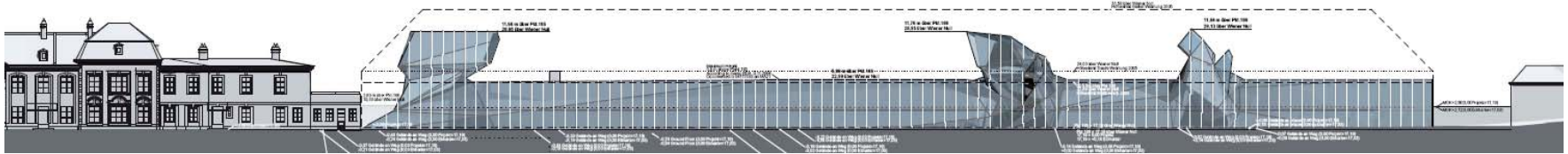




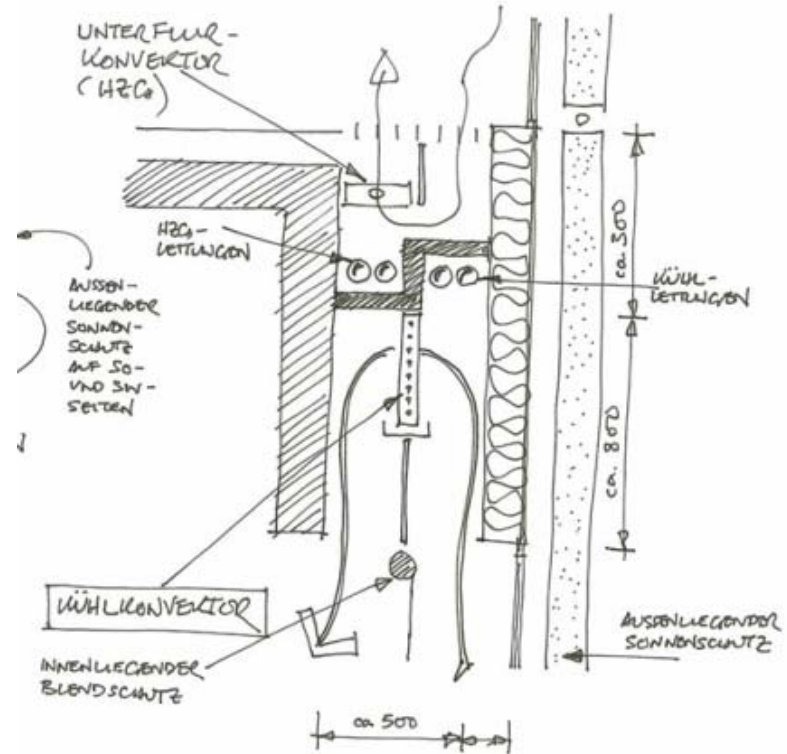
mocape shenzhen china - coop himmaltbau - controlled diffuse daylight via grid roof



hotel schwarzenberg vienna - wolfgang tschappeller - low energy high comfort hotel design

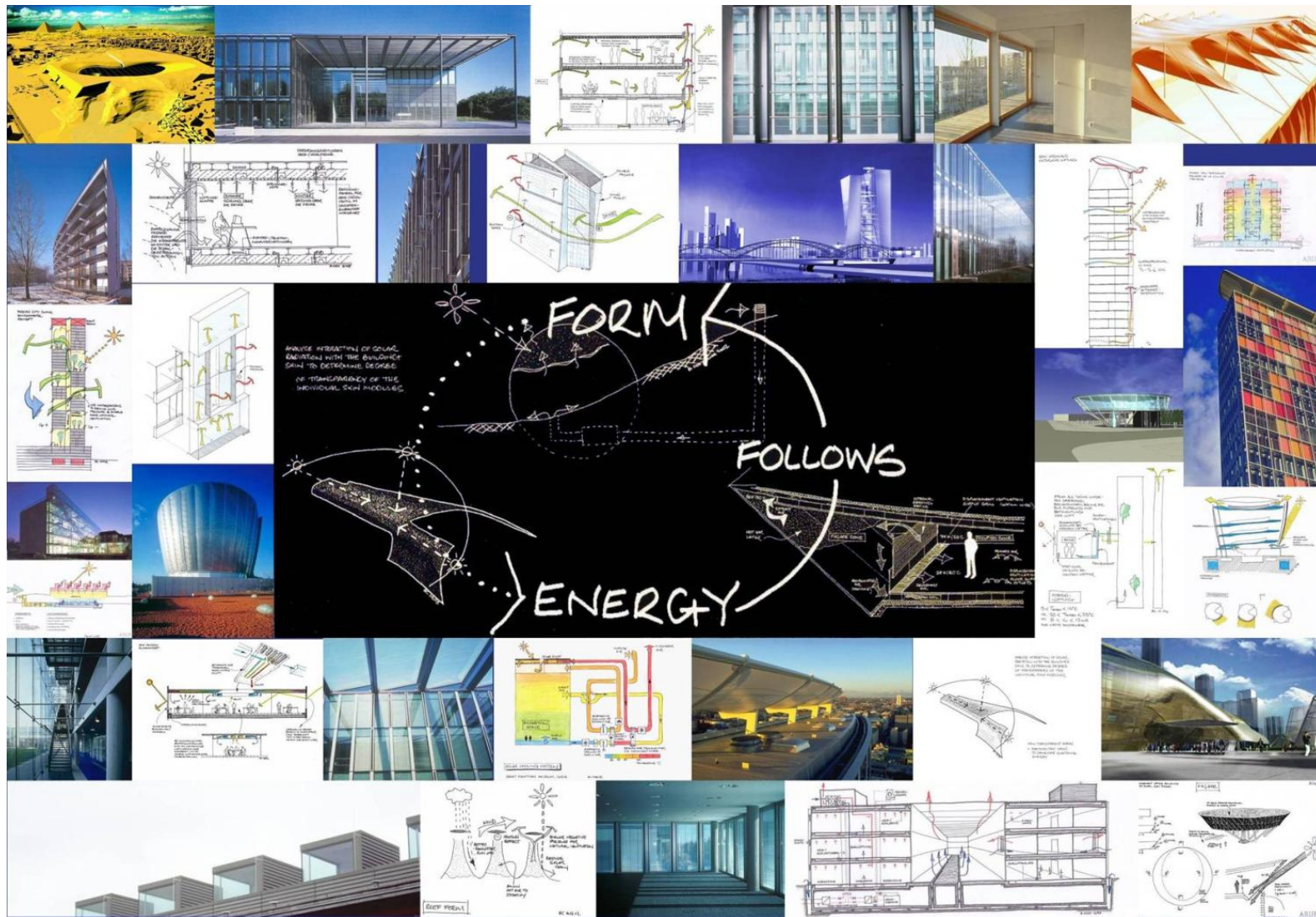


paulinenstrasses tuitgart – schneider + schumacher – integrated facade and hvac systems

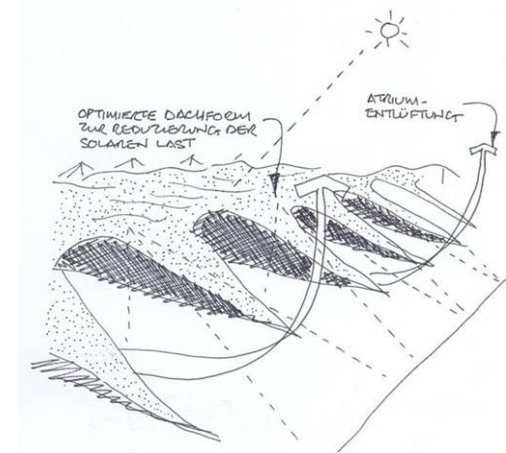
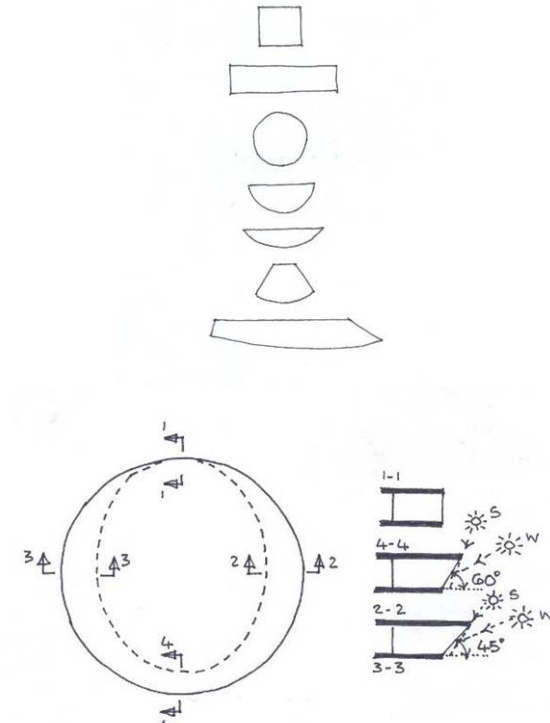
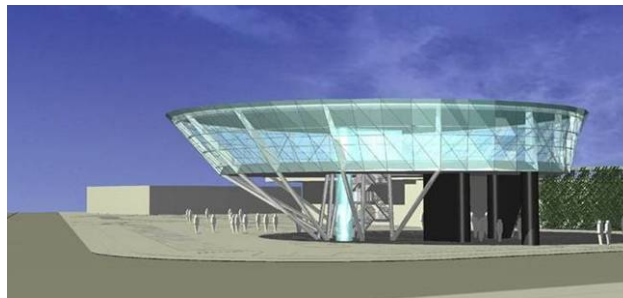
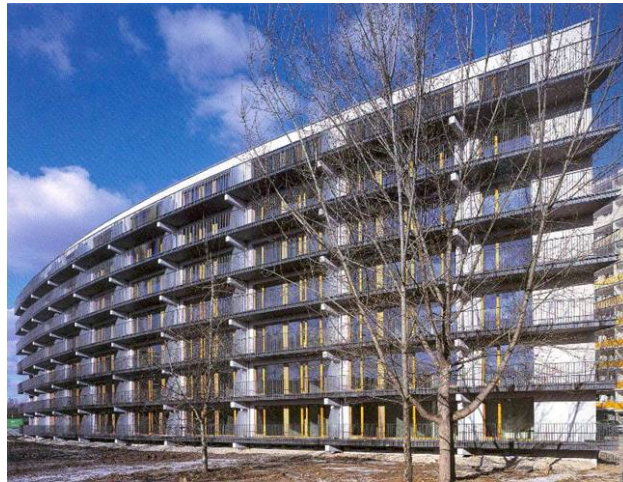


form follows energy

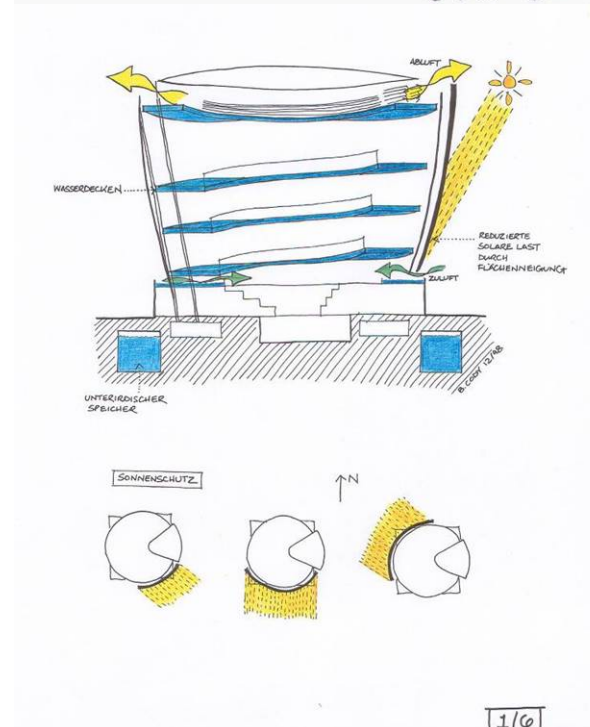
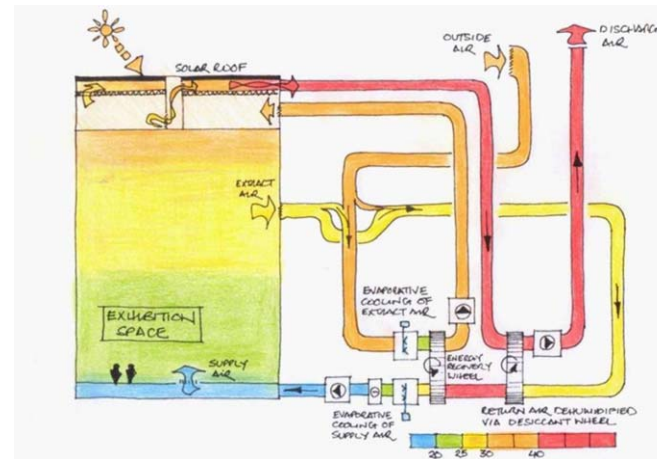
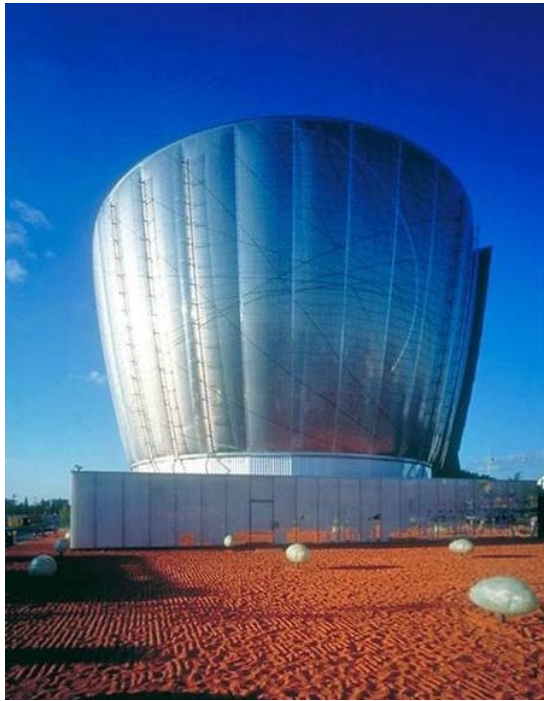
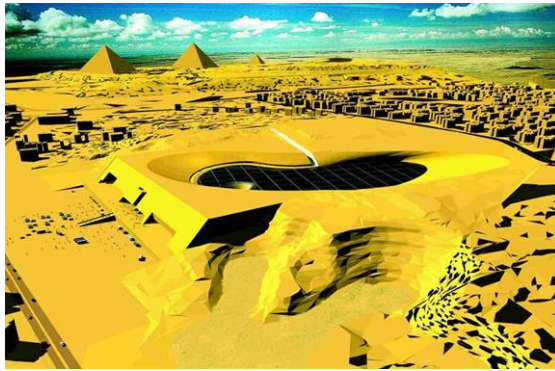
the relationship between building form and energy efficiency



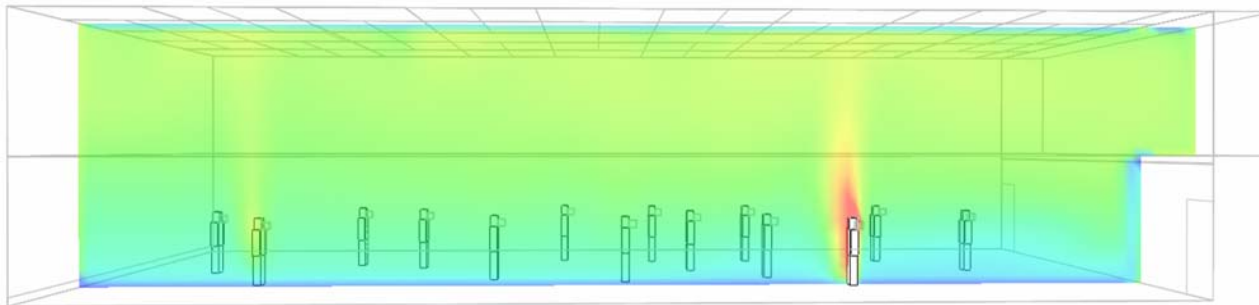
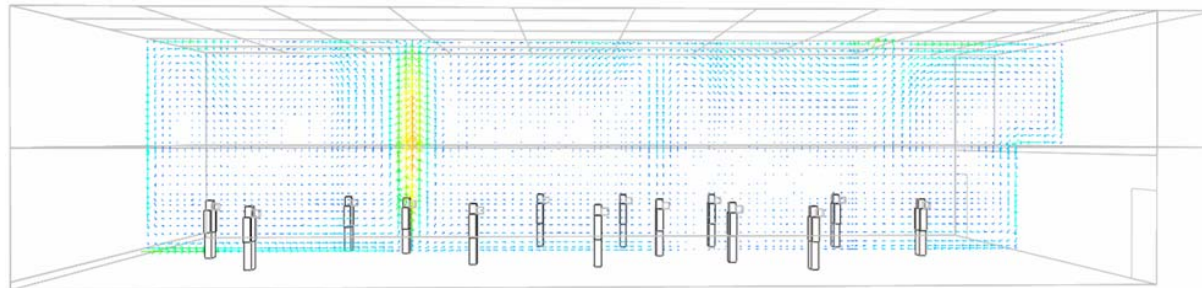
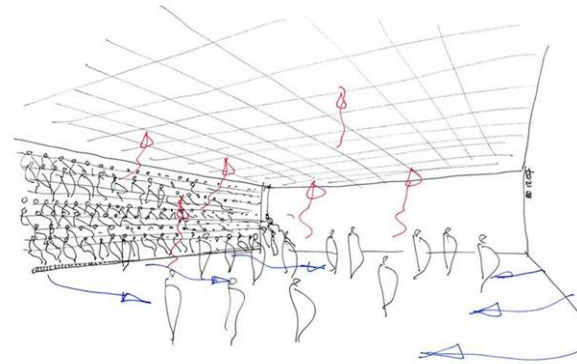
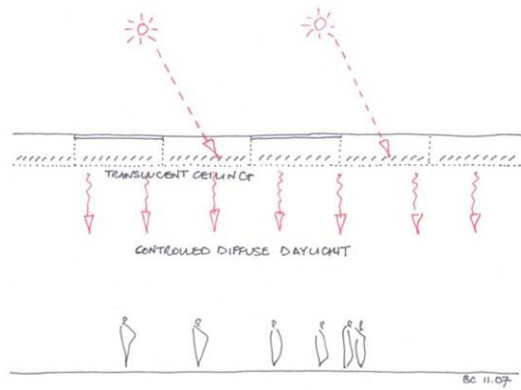
case studies - low energy housing berlin, sunbelt offices san diego, infineon hq singapore



case studies - great egyptian museum giza, duales system pavilion, expo 2000 hanover

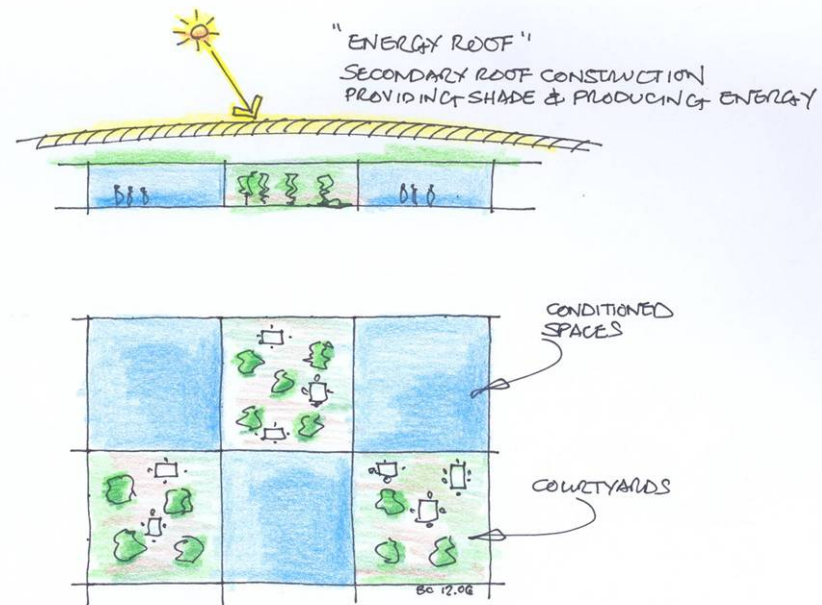


research project - sport hall of the future, puconci, slovenia

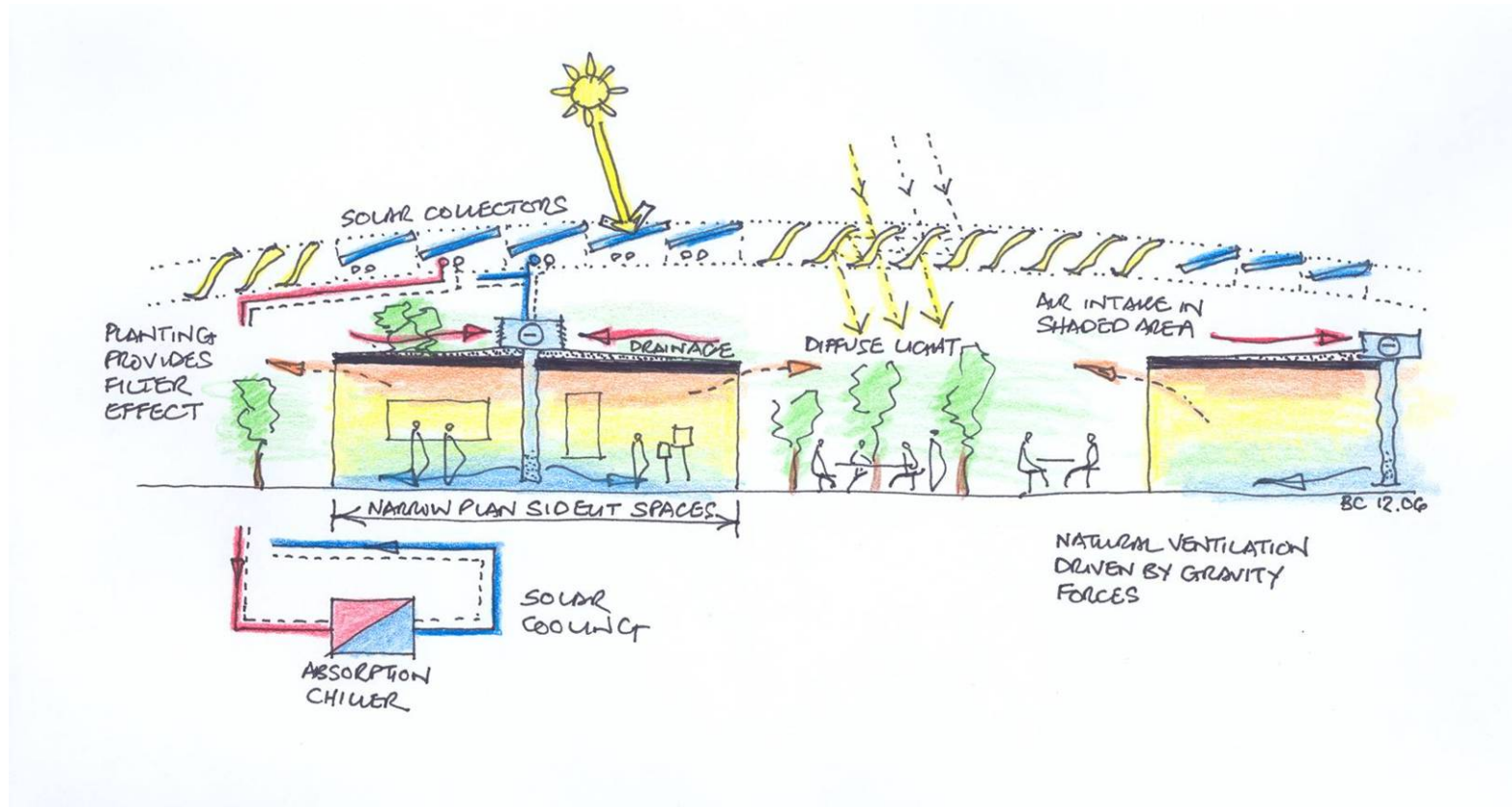




case study - mcur museum, , la reunion



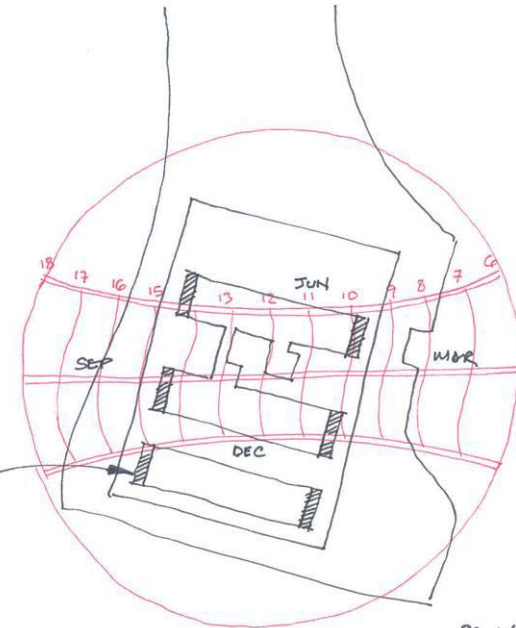
case study - mcur museum, , la reunion - natural ventilation of the exhibition spaces



case studies - media hub, singapore - building as a power plant

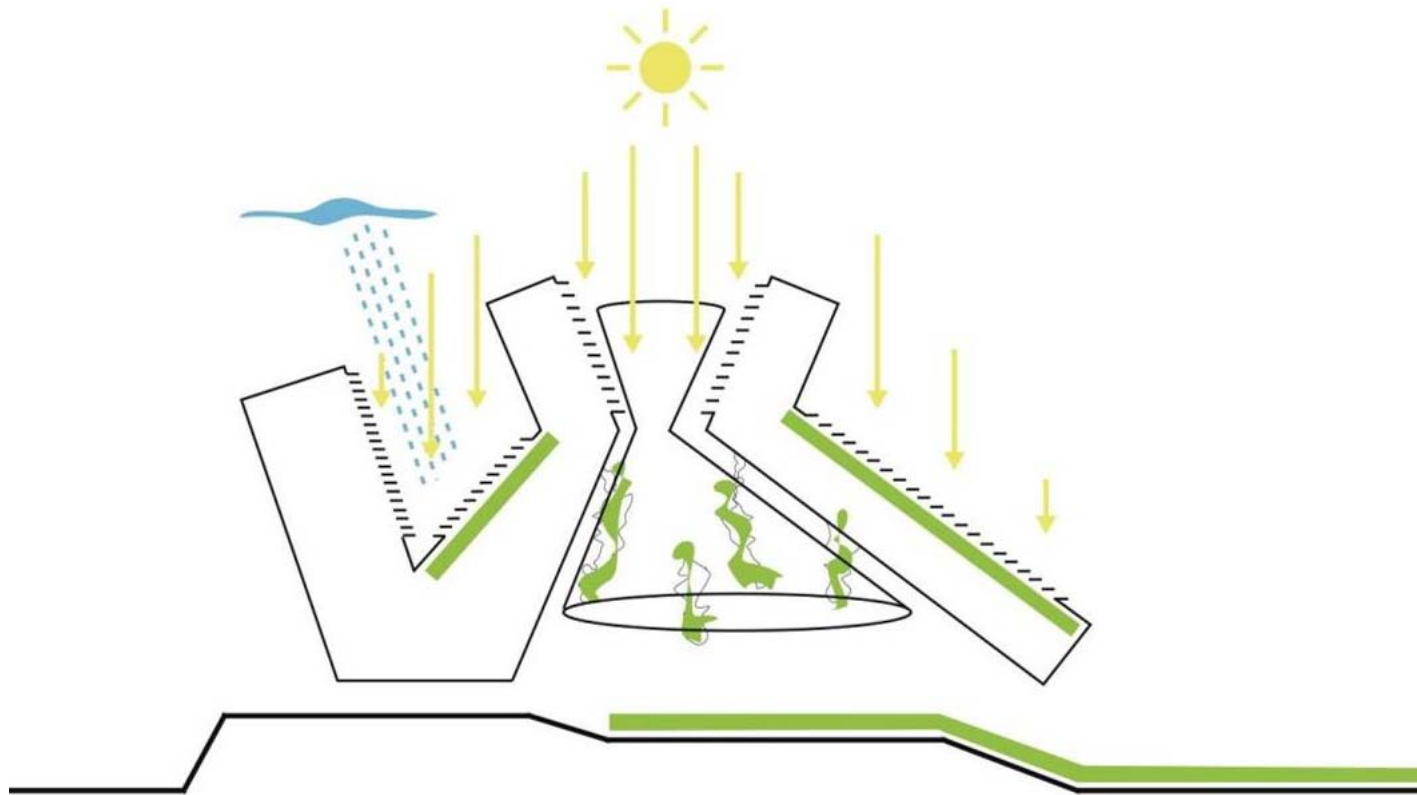


CORES LOCATED ON EAST & WEST SIDES TO REDUCE SOLAR LOAD DUE TO LOW ANGLE SUN

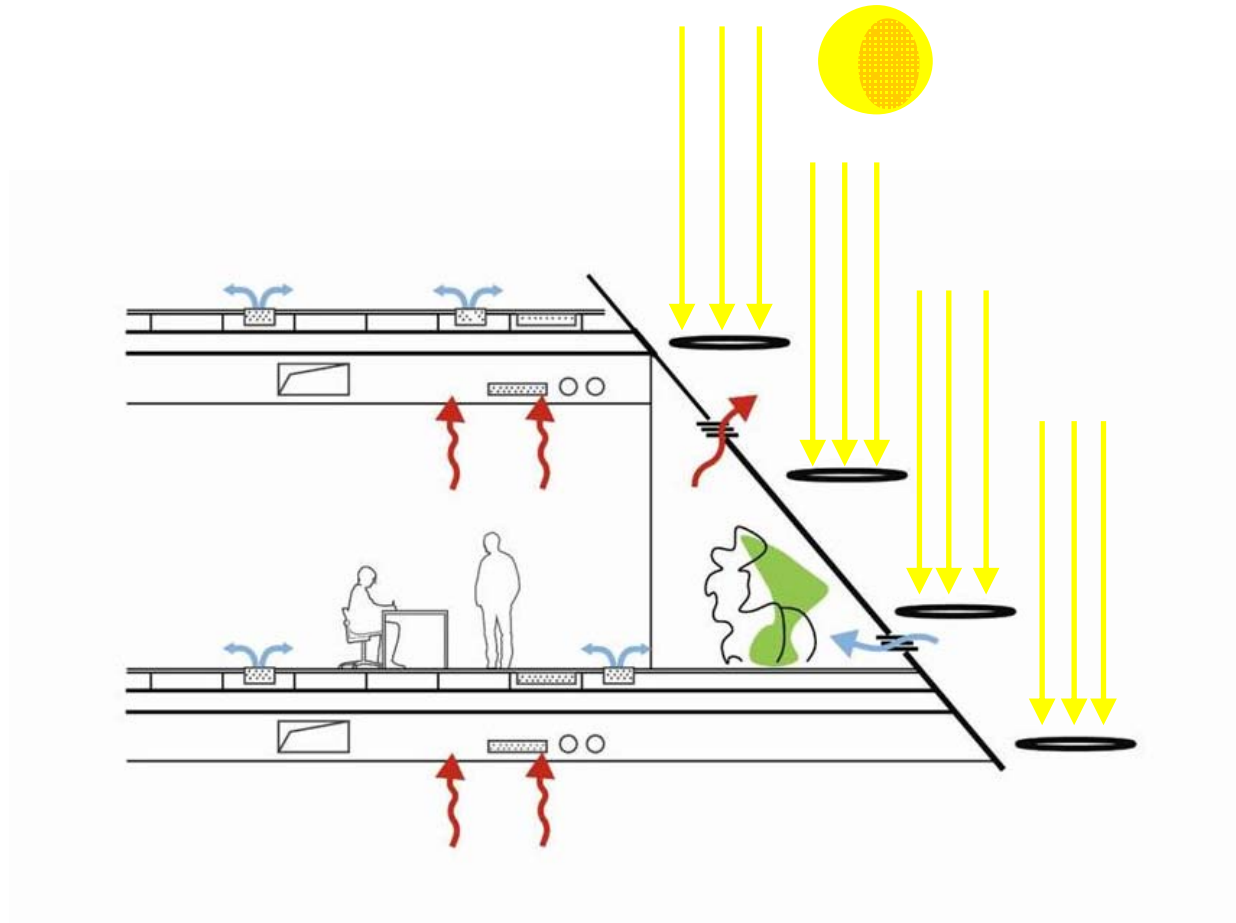


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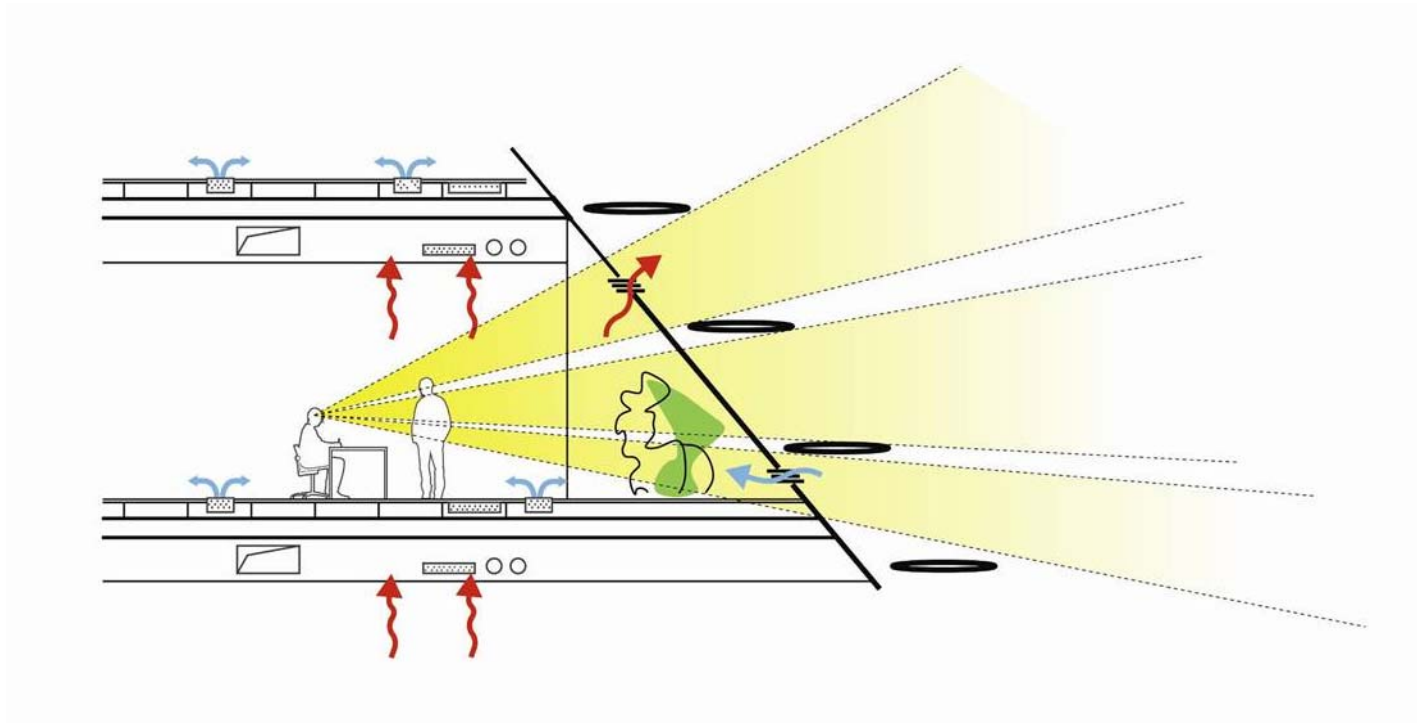
building as a power plant - solar blades, 12 000 m<sup>2</sup> pv, 2300 MWh/a



building as a power plant - solar blades, 12 000 m<sup>2</sup> pv, 2300 MWh/a



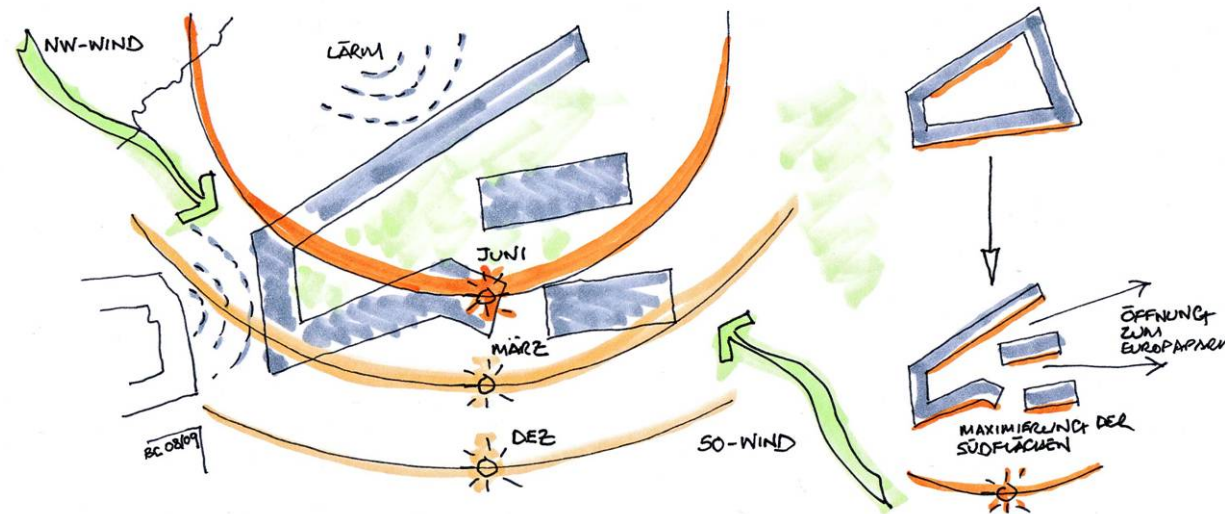
building as a power plant - solar blades, 12 000 m<sup>2</sup> pv, 2300 MWh/a



residential complex, sonnwendviertel vienna – elsa prochazka, behf, querkraft, arup

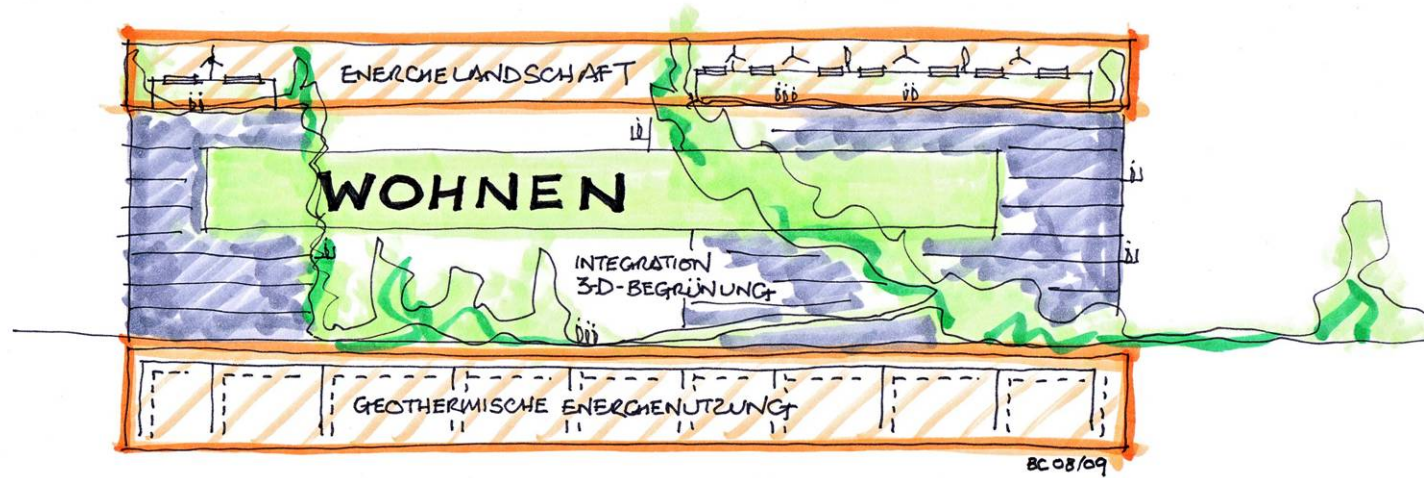


case study - residential complex, sonnwendviertel vienna - energy landscaping

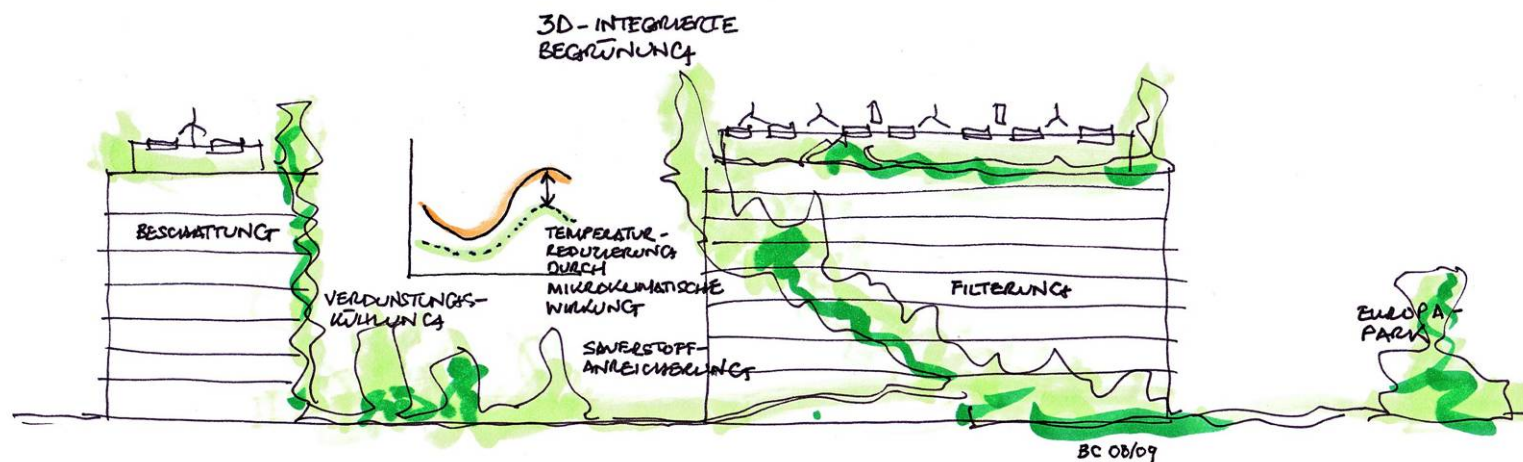




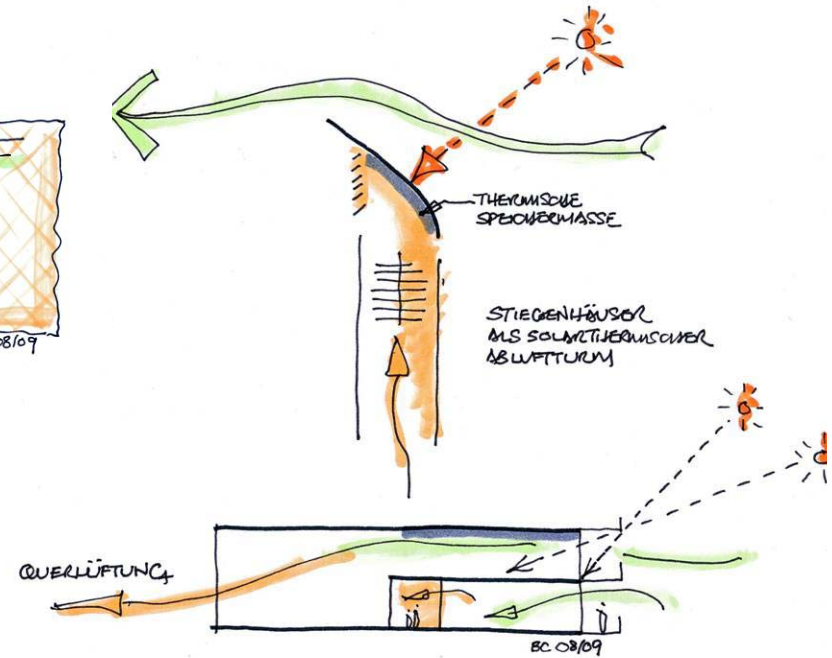
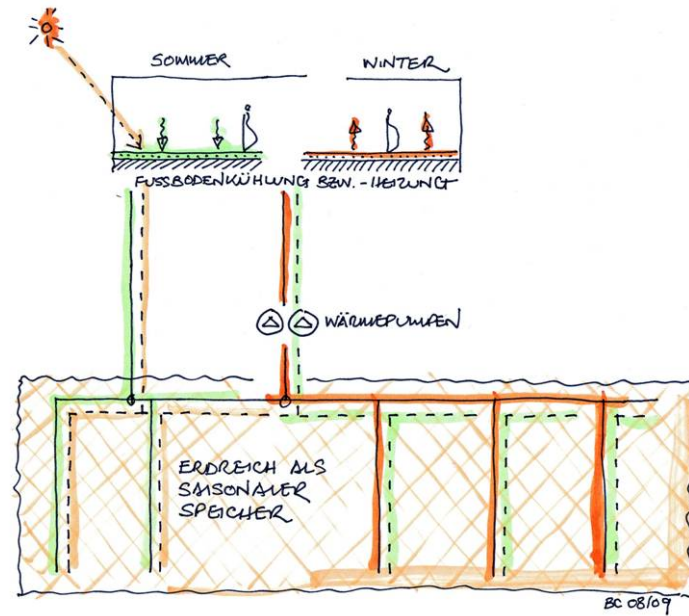
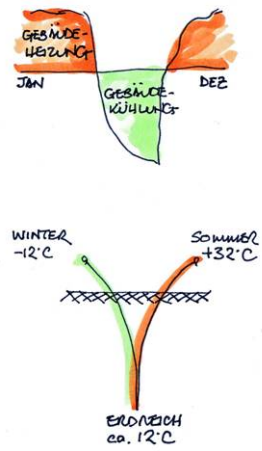
case study - residential complex, sonnwendviertel vienna - energy landscaping



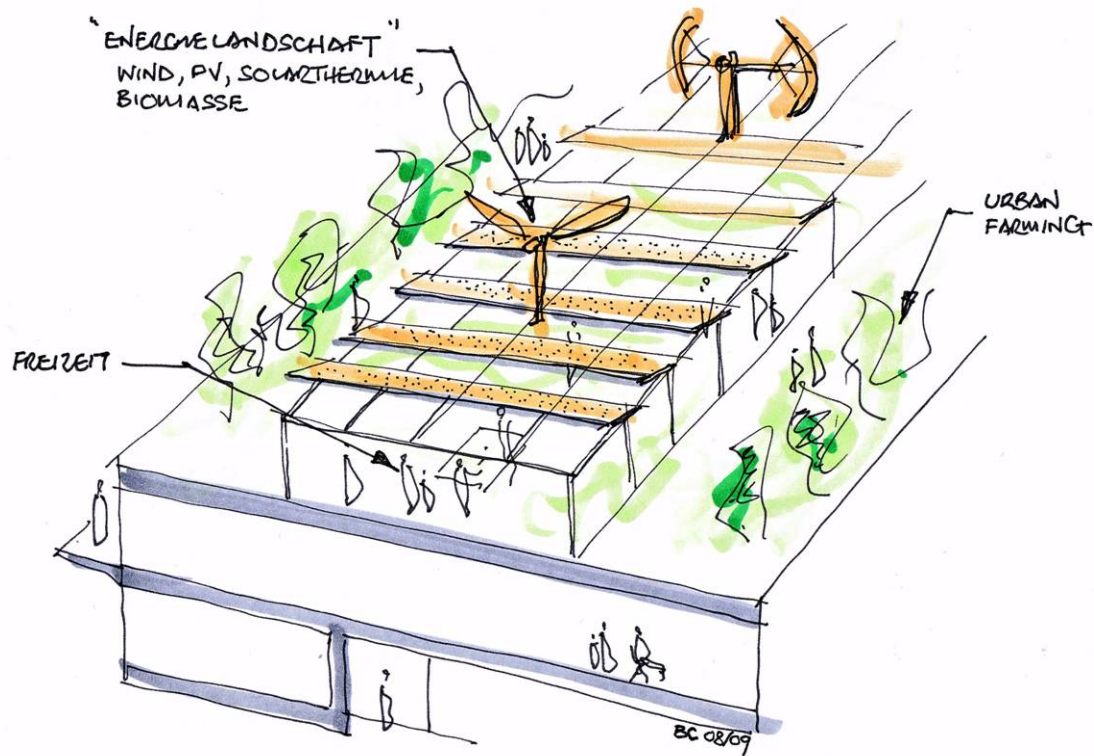
case study - residential complex, sonnwendviertel vienna - energy landscaping



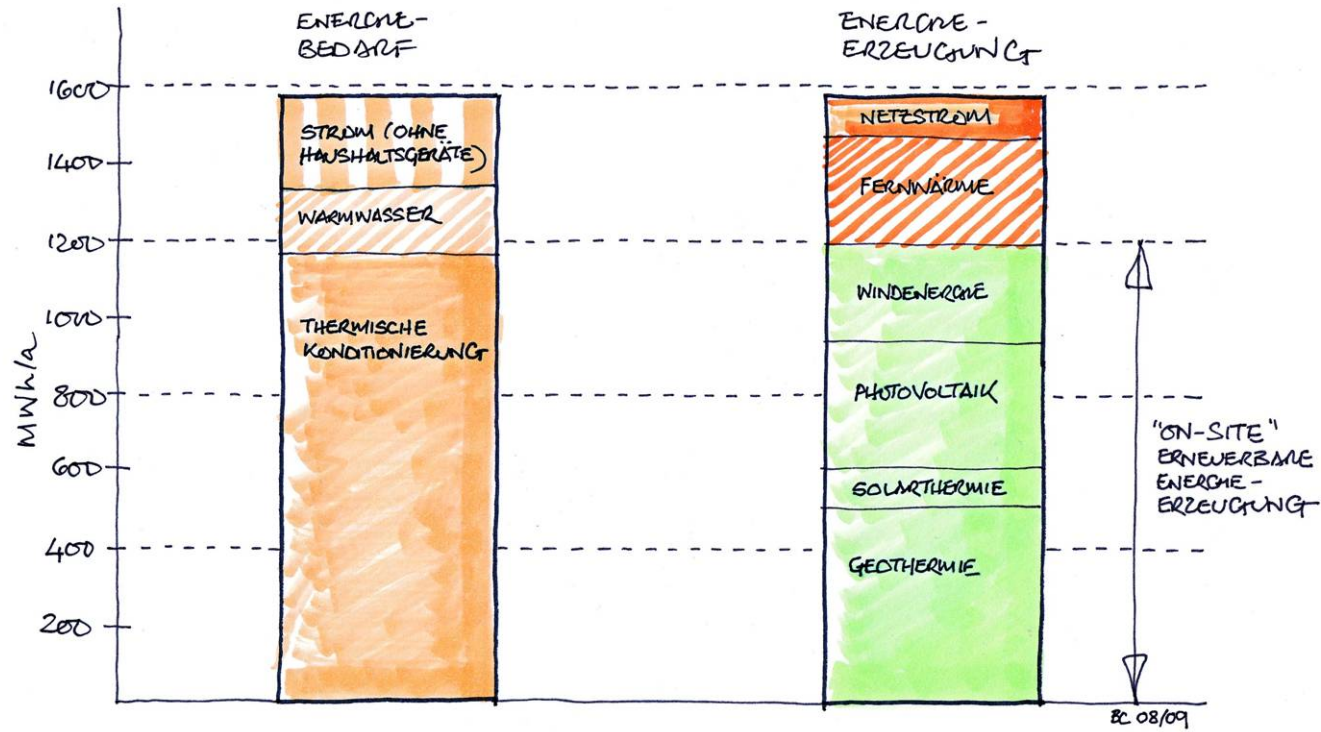
case study - residential complex, sonnwendviertel vienna - energy landscaping



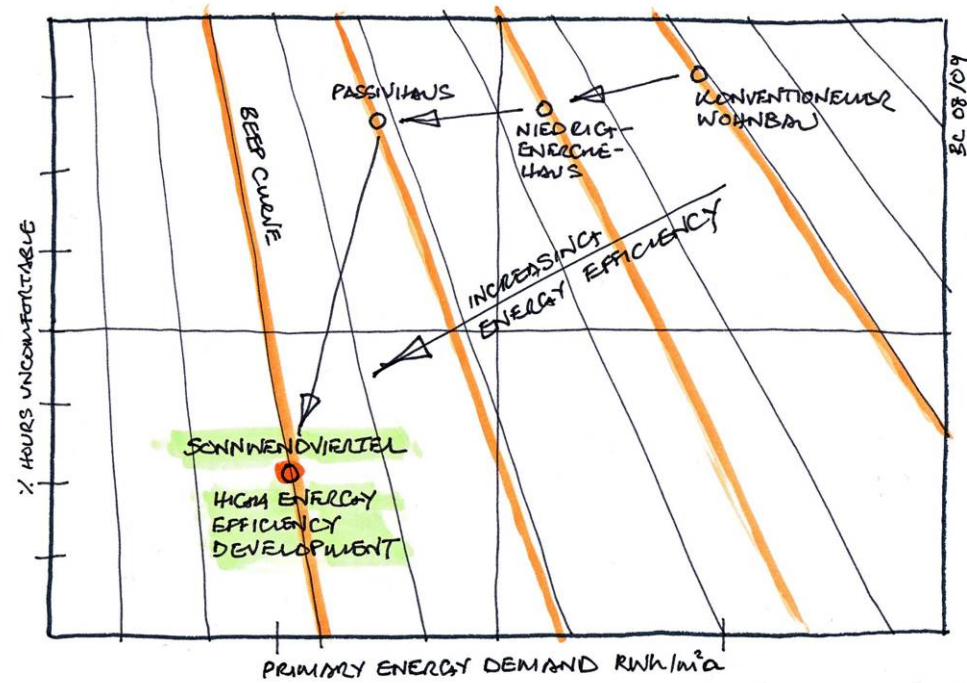
case study - residential complex, sonnwendviertel vienna - energy landscaping



case study - residential complex, sonnwendviertel vienna - energy landscaping



case study - residential complex, sonnwendviertel vienna - energy landscaping

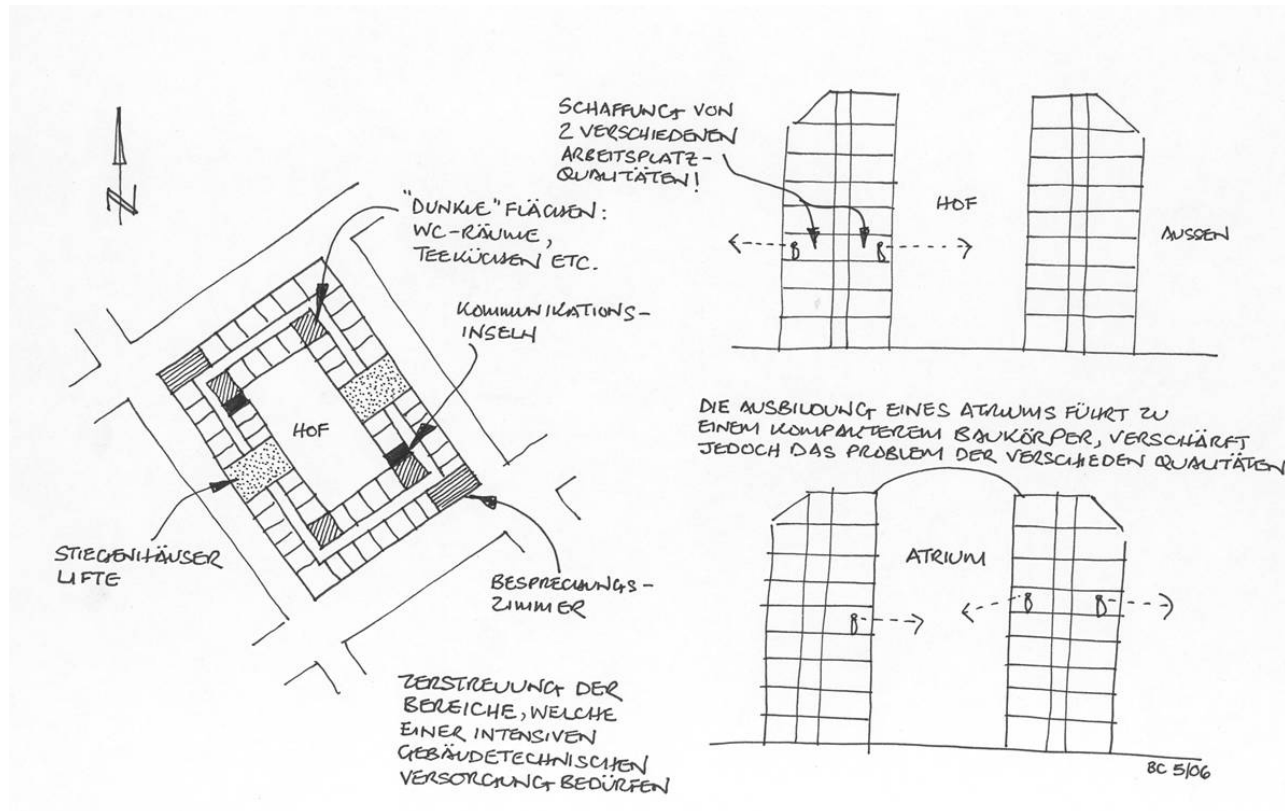


BEEP - DIAGRAMM  
BUILDING ENERGY AND ENVIRONMENTAL PERFORMANCE

case studies - oevag bank hq, vienna

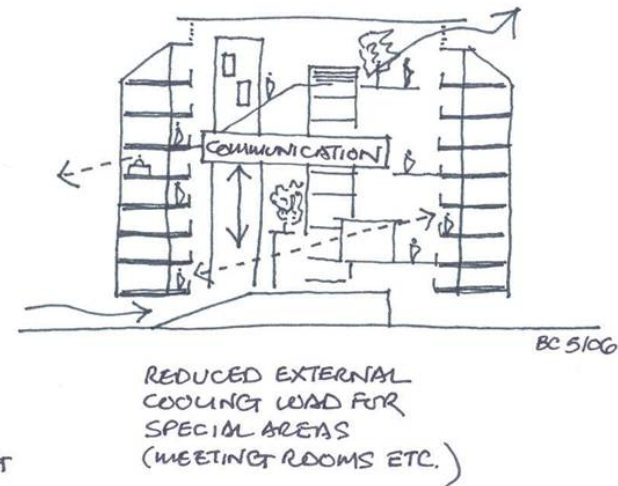
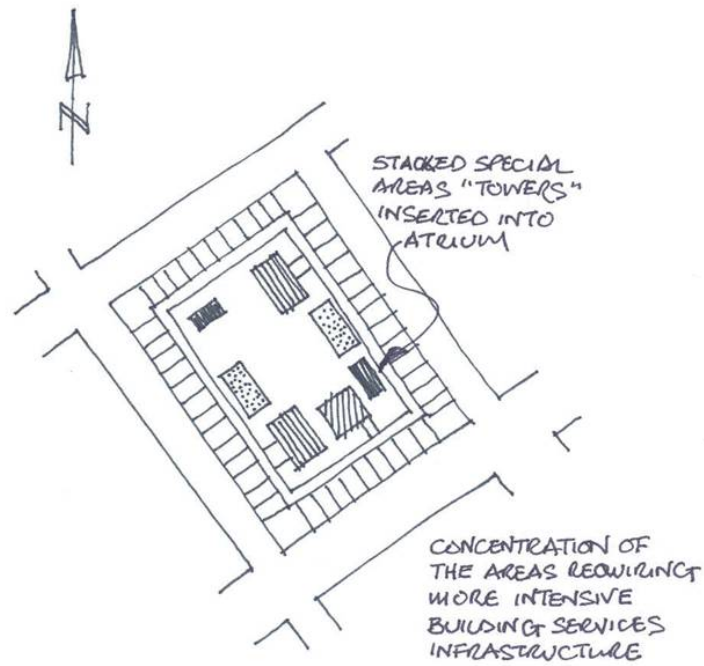


case studies - oevag bank hg, vienna

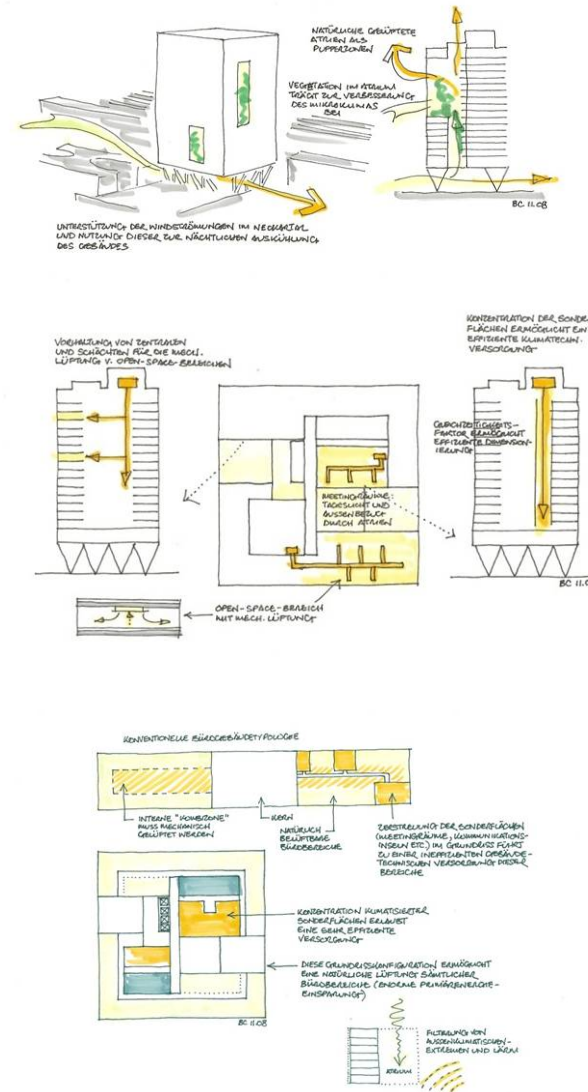




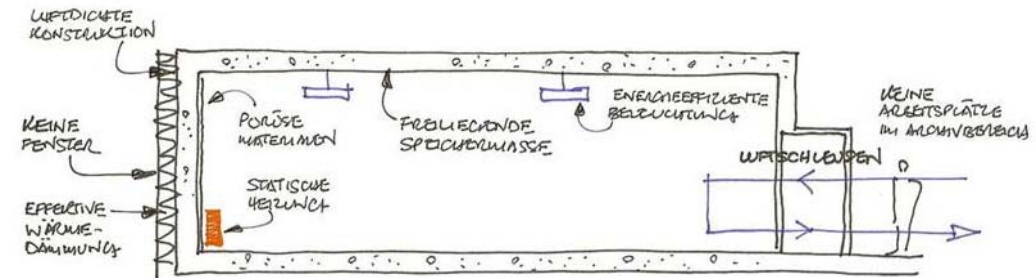
case studies - oevag bank hg, vienna



case study - daimler hq. stuttgart, architecture ksp, engineering arup

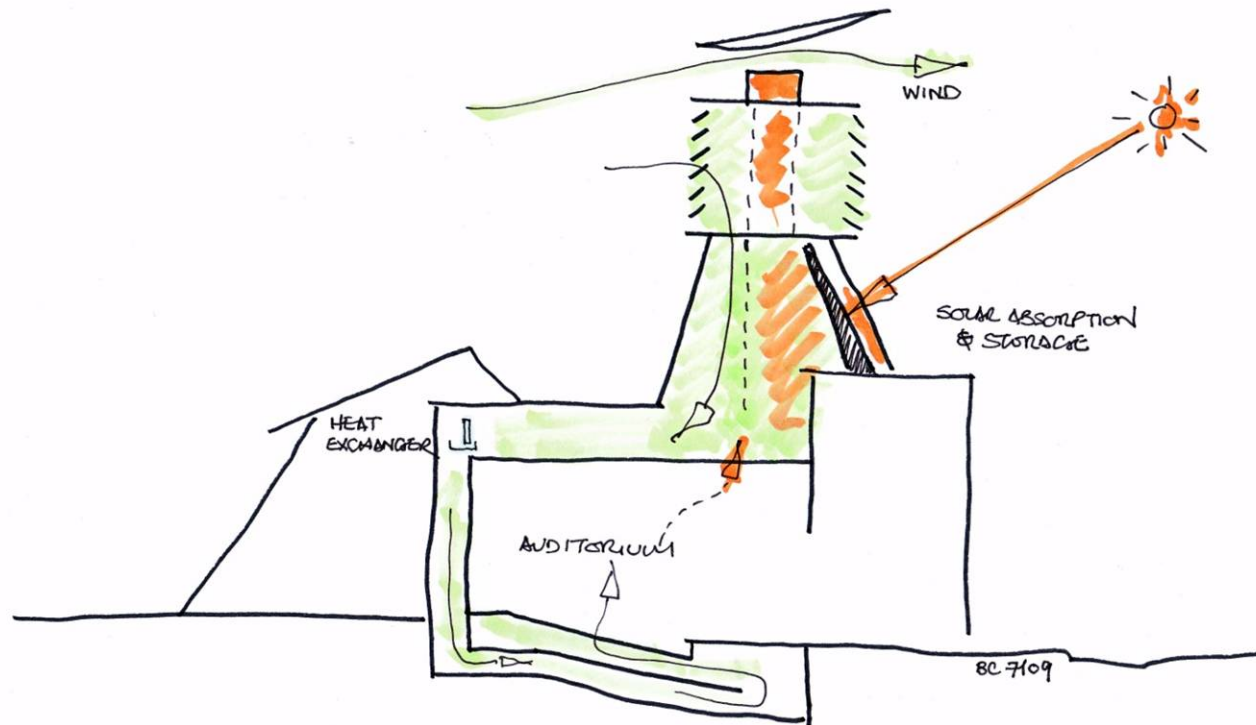


case study - landesarchiv nrw, duisburg - passive conditioning of the archiv spaces



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case study - cultural center zarautz, natural ventilation of a 600 seat concert hall

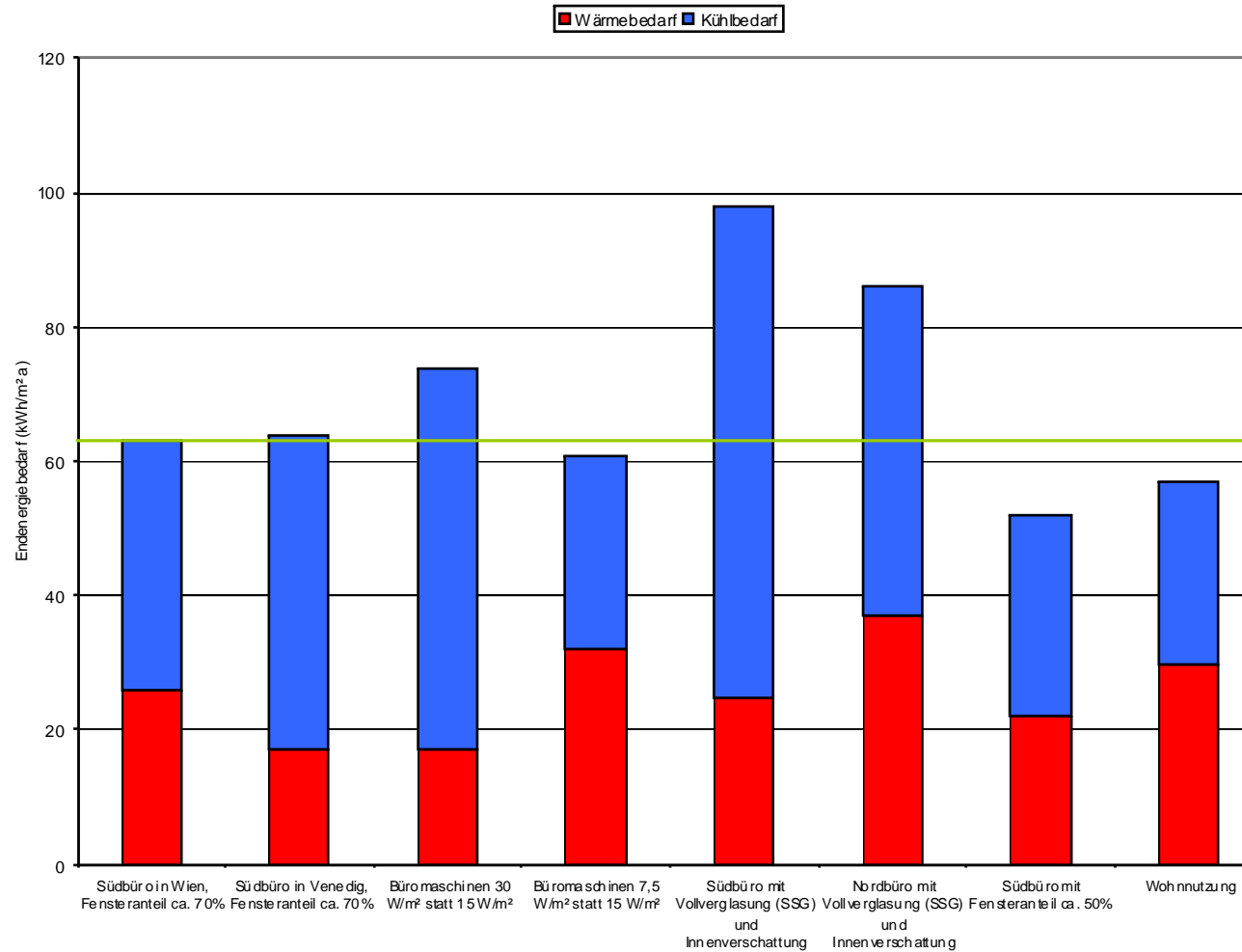




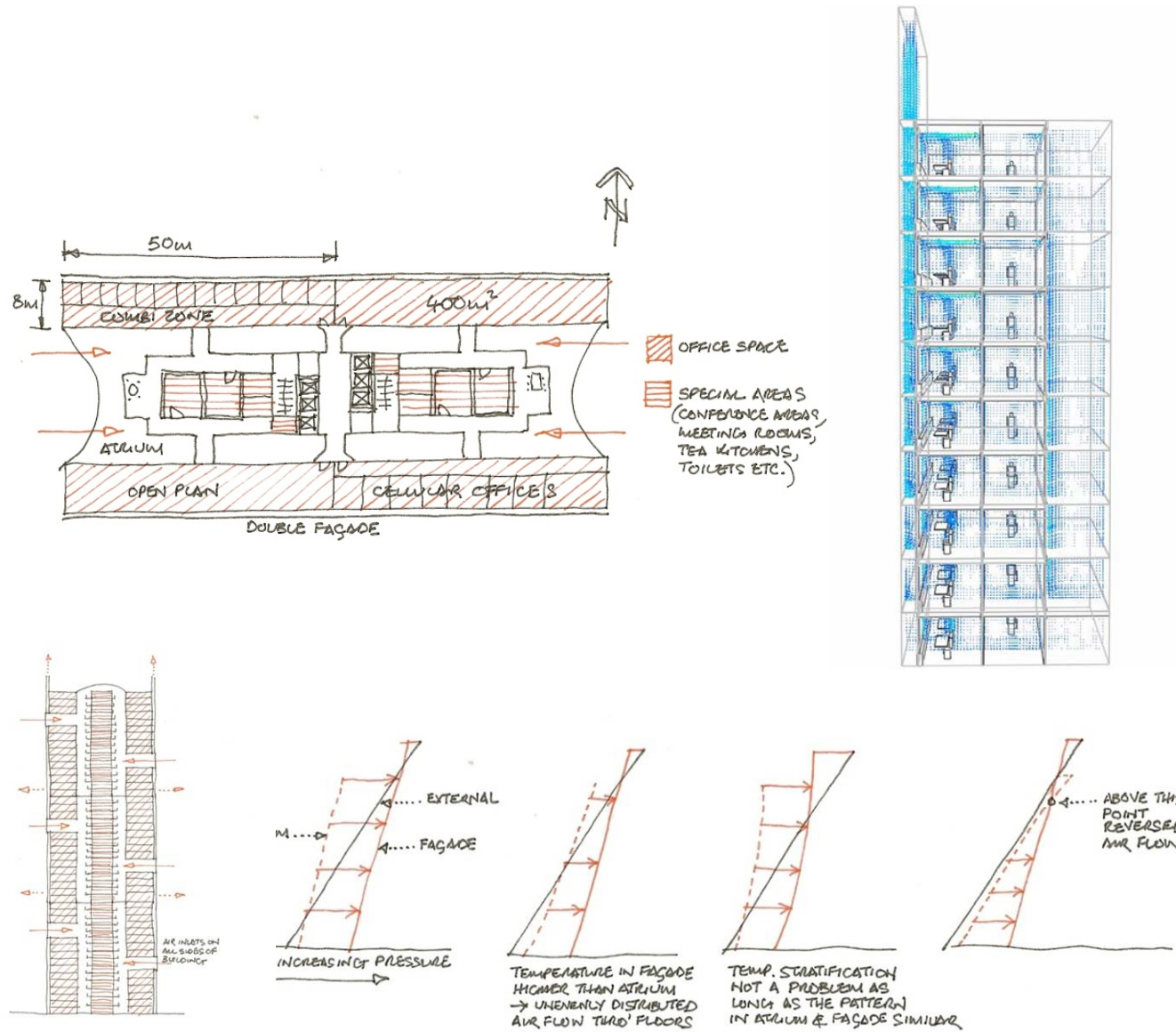
flexibility and adaptability - usage neutral architecture



climate change - influence on heating and cooling energy demand of buildings

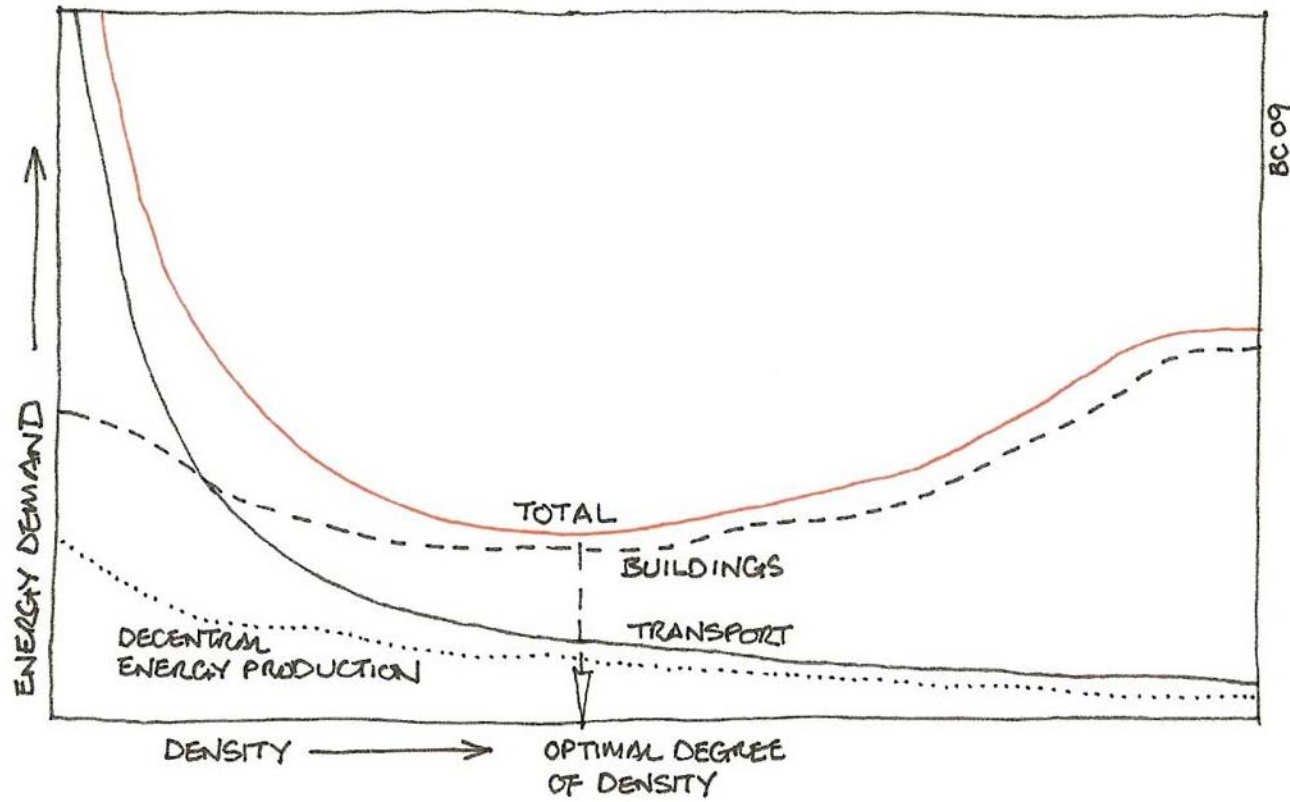


natural ventilation of tall buildings - research project, tu graz

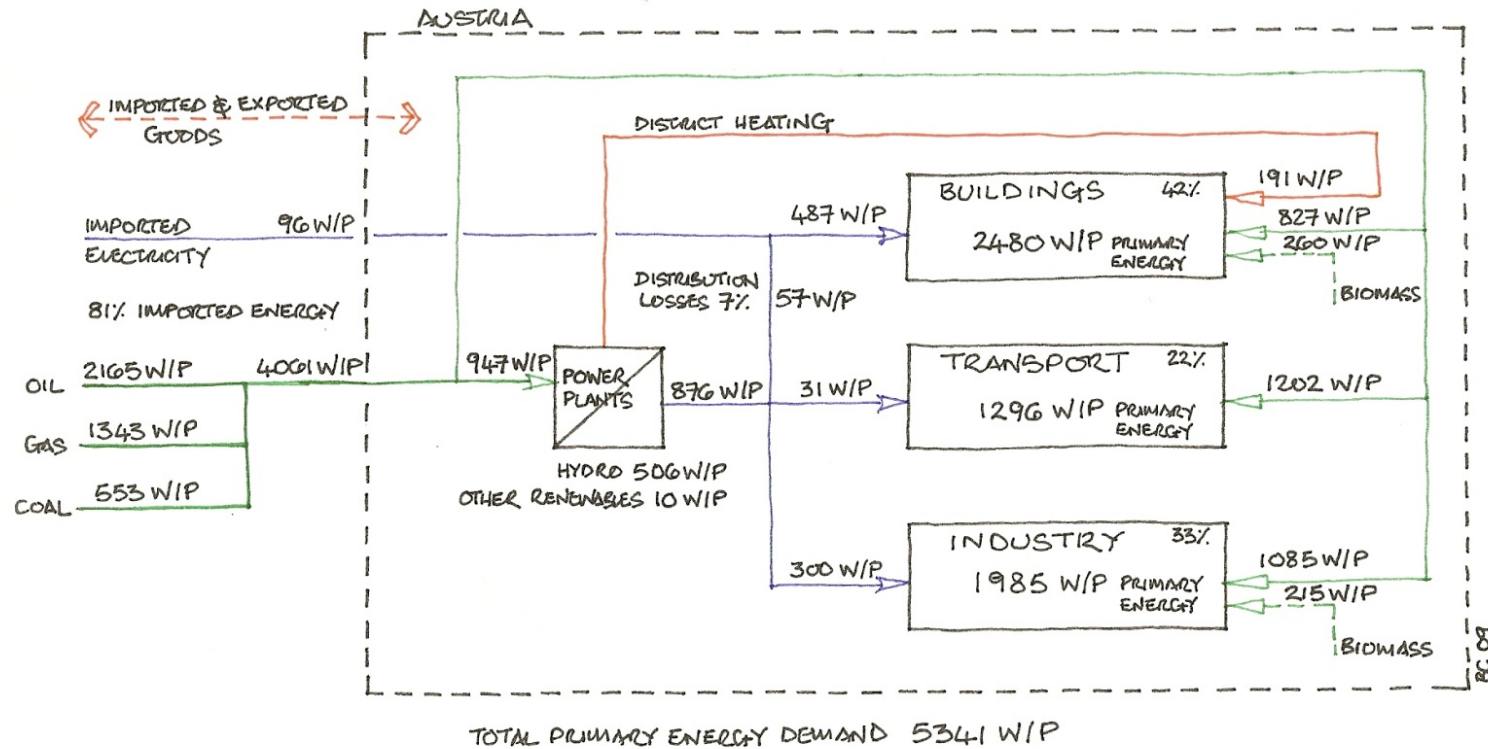




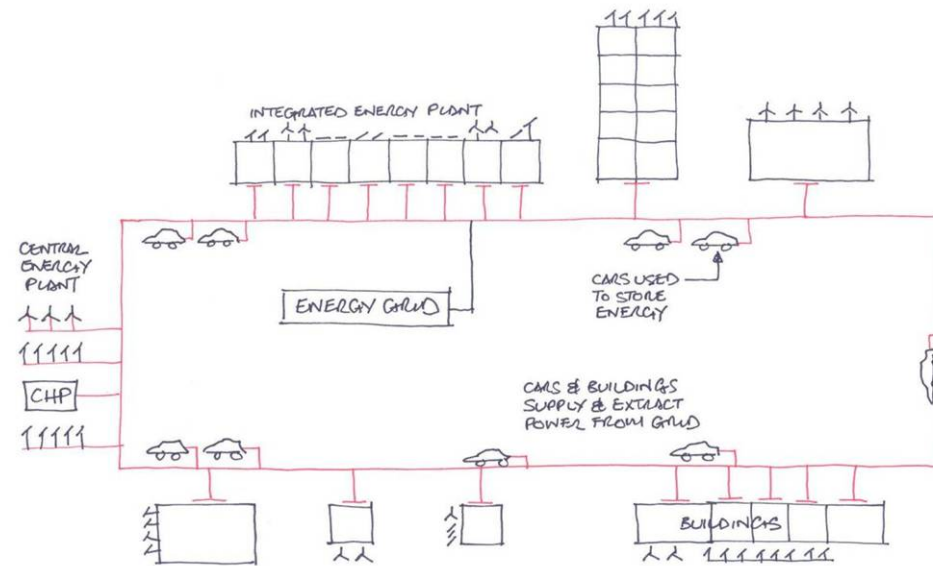
optimal degree of density - research, tu graz



energy model of austria - research, tu graz



energy model of austria - research, tu graz



structural changes, teleworking and energy efficiency in society - research, tu graz

