







### Pope Alexander the 7th 1656

### PROHIBITIO

Extrahendi libros, quinterna, & folia, tam impressa, quam manuscripta è Bibliothecis Conventuum Fratrum Capuccinorum.

#### ALEXANDER PP. VII.

AD FUTURAM REI MEMORIAM.



Onservationi, & manutentioni librorum Bibliothecarum omnium, & singulorum Conventuum Fratrum Ordinis Minorum S. Francisci Capuccinorum nuncupat, in quacumque mundi parteexistentium, quantum cum Domino possumus, benigne consulere, ac dilectum Filium modernum dicti Ordinis Ministrum Generalem specialibus favoribus, & gratis prosequi volentes, & à quibusvis excommunicationis, suspensionis, & interdi-

cti, aliisque Ecclesiasticis sententiis, censuris, & poenis à jure, vel ab homine quavis occasione, vel causa latis, si quibus quomodolibet innodatus existit, au essectum præsentium dumta xat consequendum, harum serie absolventes, & absolutum force censentes, supplicationibus ejustem Ministri Generalis nomine, nobis super hoc humi-liese porrectis inclinati. Ne de catero quisquam, quavis auctoritate, superioritate, seu offit i fungens libros quinterna, folia, aut scripturas, tam impressa, qu'am manuscripta, tam hactenus per quoteumque Christinicles dichi Biblic hecis telpective donata, è al figna qu'am in posterum forsan donanda, & assignand quibusvis personis præterquam Fratribus dichi Ordinis, qui quidem libros à Biblic hecis hujusmodi respective de Superioribus, seu Bibliothecarii pro tempore existentis siceutia extrahere, è eis procommuni Conventuum hujusmodi, & particulari Fratrum dicti Ordinis usu in suis cellulis, Fratribus quoque ejusdem Ordinis verbum Dei prædicantibus, qui etiam extra suos Conventus, uti possint, sed sinito usu hujusmodi, subito ad dicas Bibliothecas respective sub infrascriptis poenis reportare omnino debeant) commodare, aut sub quovis quæsito colore, ingenio, causa, ratione, aut occasione à dichis Bibliothecis extrahere, & asportare, feu ut commodentur, aut extrahantur, & afportentur permittere, aut confentire audeat, seu præsumat, sub excommunicationis latæ sententiæ, ac privationis vocis activæ, & passivæ pænis per contrafacientes eo ipso incurrendis, Apostolica auctoritate tendre præfentium interdicimus, & prohibemus: Non obstantibus constitutionibus, & ordinationibus Apostolicis, ac Ordinis, & Conventuum prædictorum, etiam juramento confirmatione Apostolica, vel quavis sirmitate alia roboratis statutis, & consuetudinibus, cæteri fque contrariis quibuscumque. Volumus autem, quod præsentis prohibitionis copia in val vis omnium, & fingularum Bibliothecarum Conventuum dicti Ordinis, feu alio confpio loco, quo ab omnibus cerni pollie, continuo affixa remaneat, quodque præfentium ti sumptis, etiam impressis, manu alicujus Notarii publici subscriptis, & sigillo persona dignitate Ecclesiastica constitutæ munitis, eadem prorsus sides adhibeatur, quæ præsentibus adhiberetur, si forent exhibitæ, vel ostensæ. Datum Romæ apud Sanctam Mariam Majorem sub Anulo Piscatoris die tertia Julii MDCLVI. Pontificatus nostri Anno secundo.

G. Gualterius.

ROMÆ, Ex Typographia Rev. Cam. Apostol. MDCLVI.



### knowledge was power

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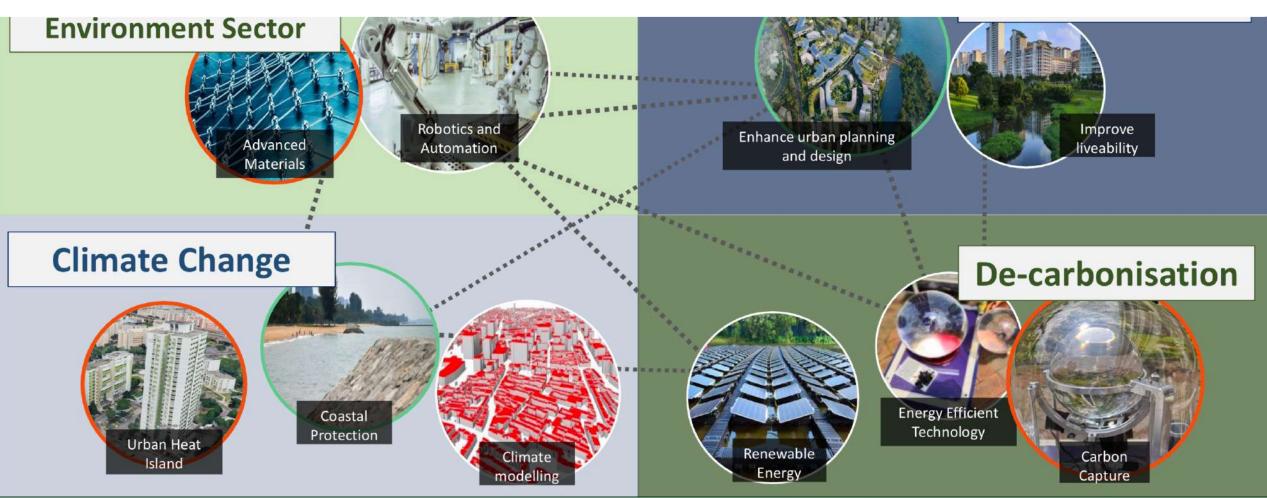


# knowledge is now a commodity; it is what you do with it that now matters



#### Game Changing Areas

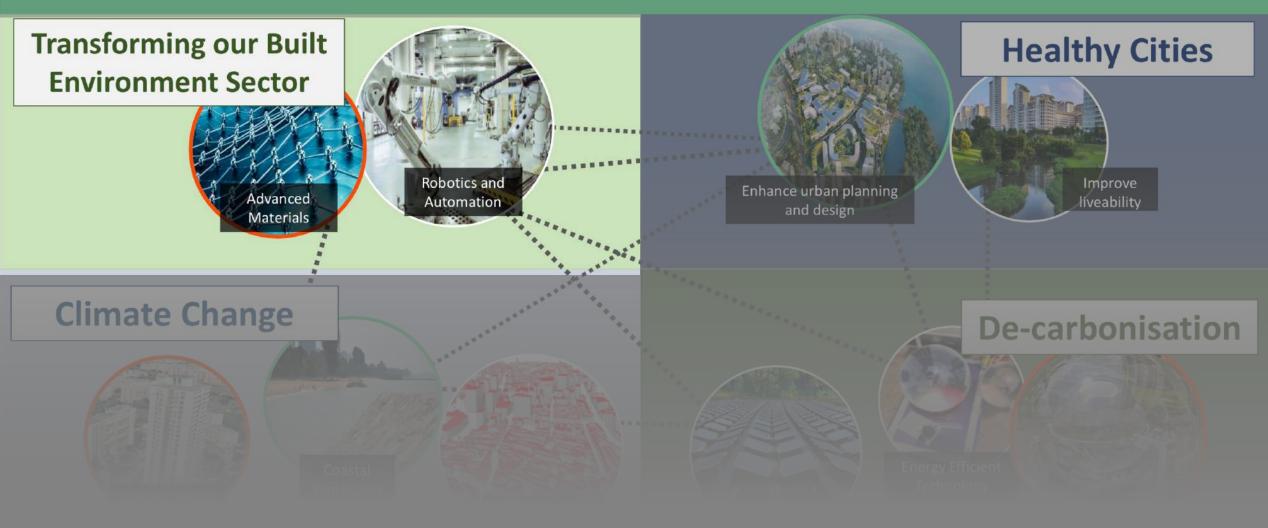
## knowledge is now a commodity; it is what you do with it that now matters



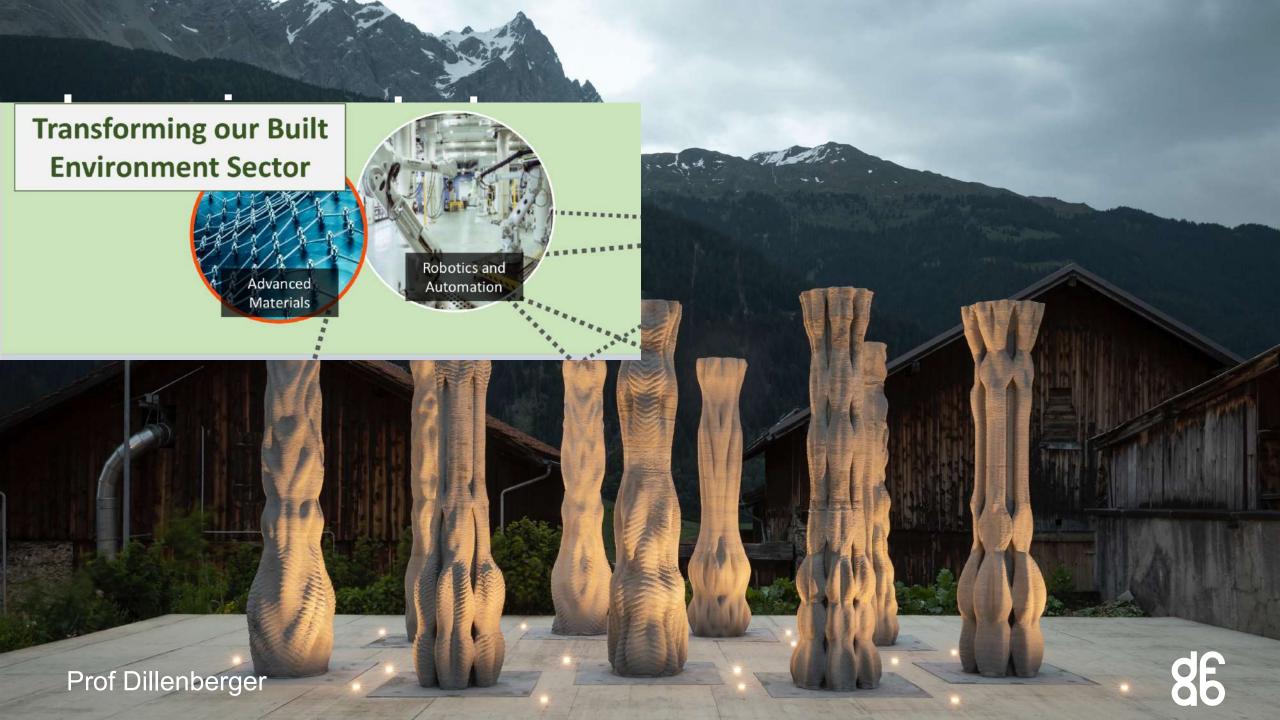


### **Game Changing Areas**

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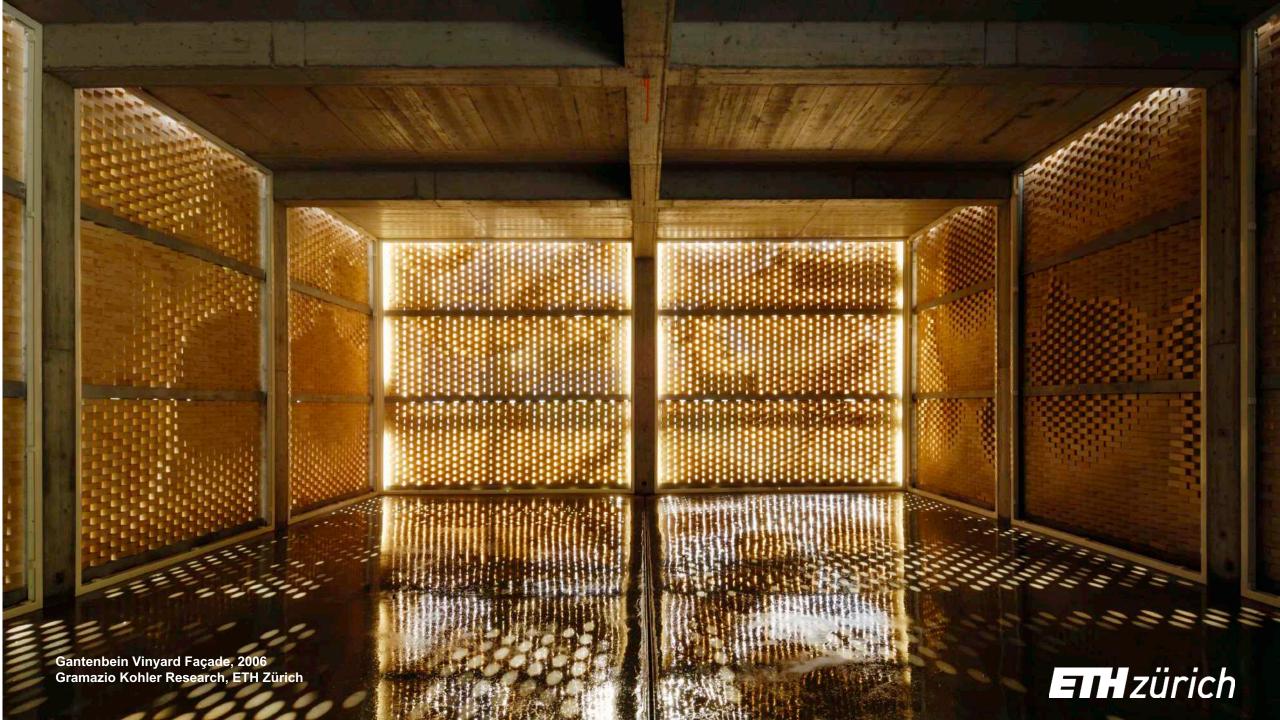






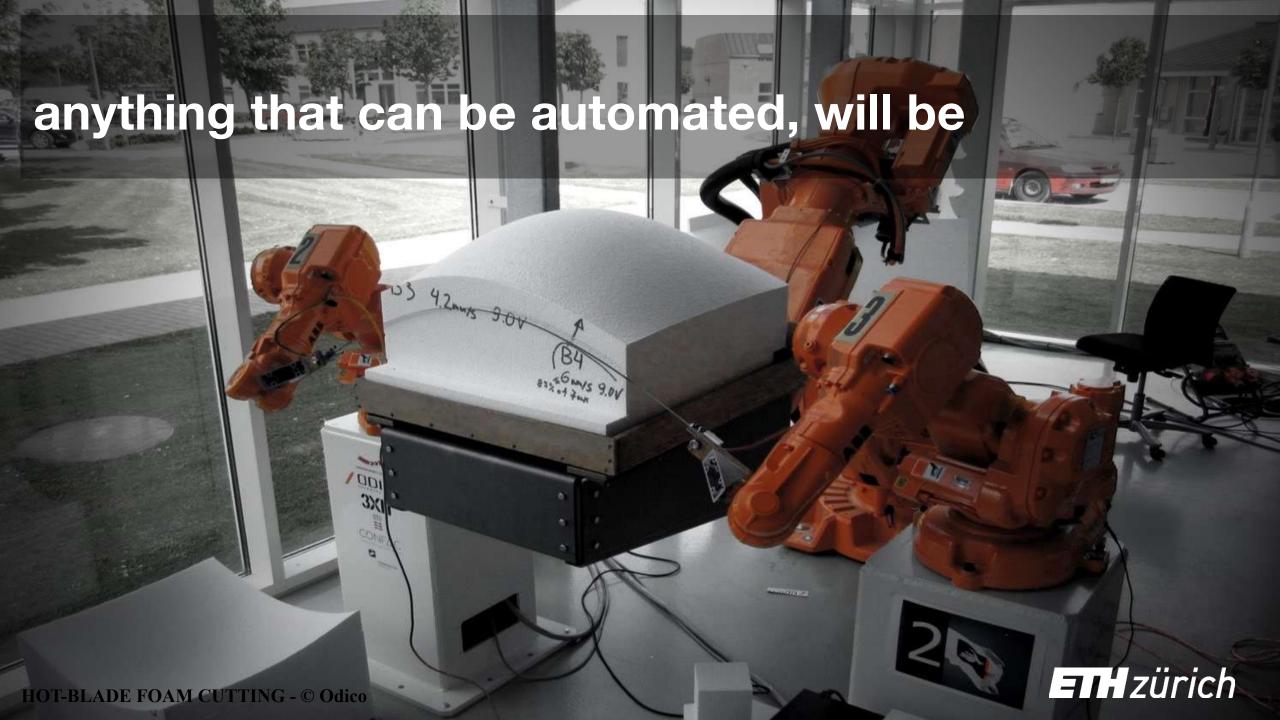








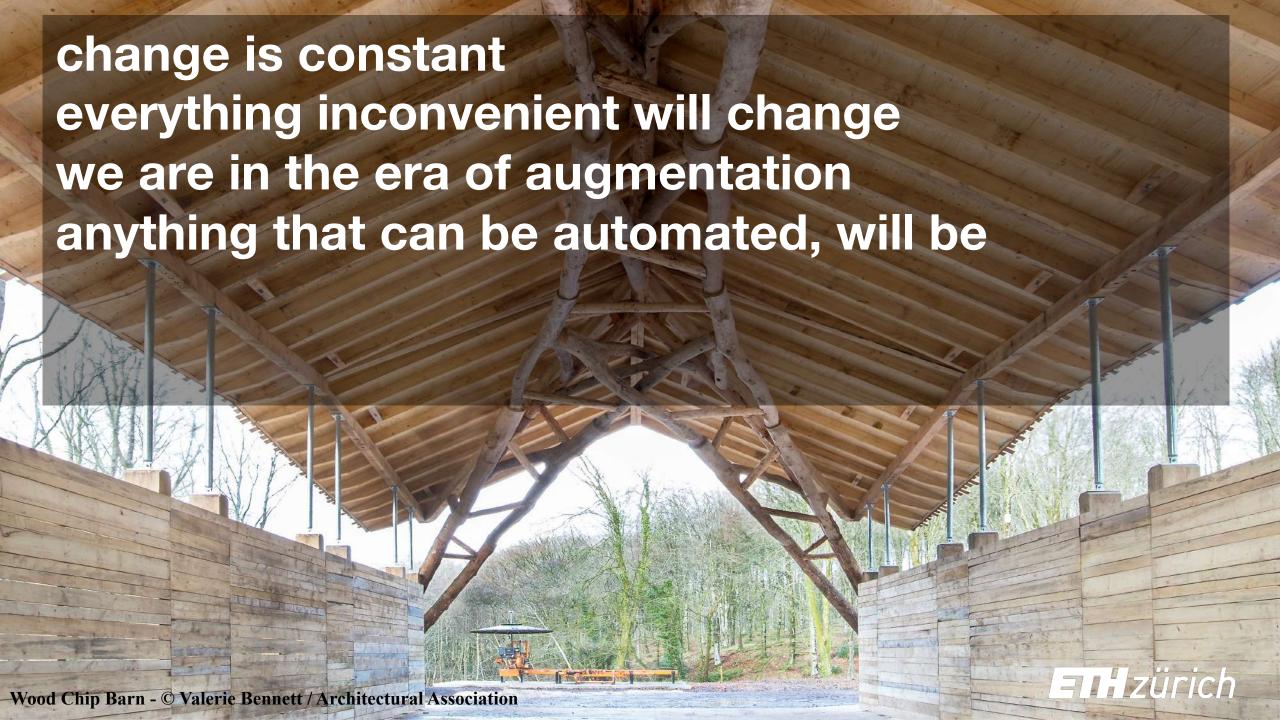






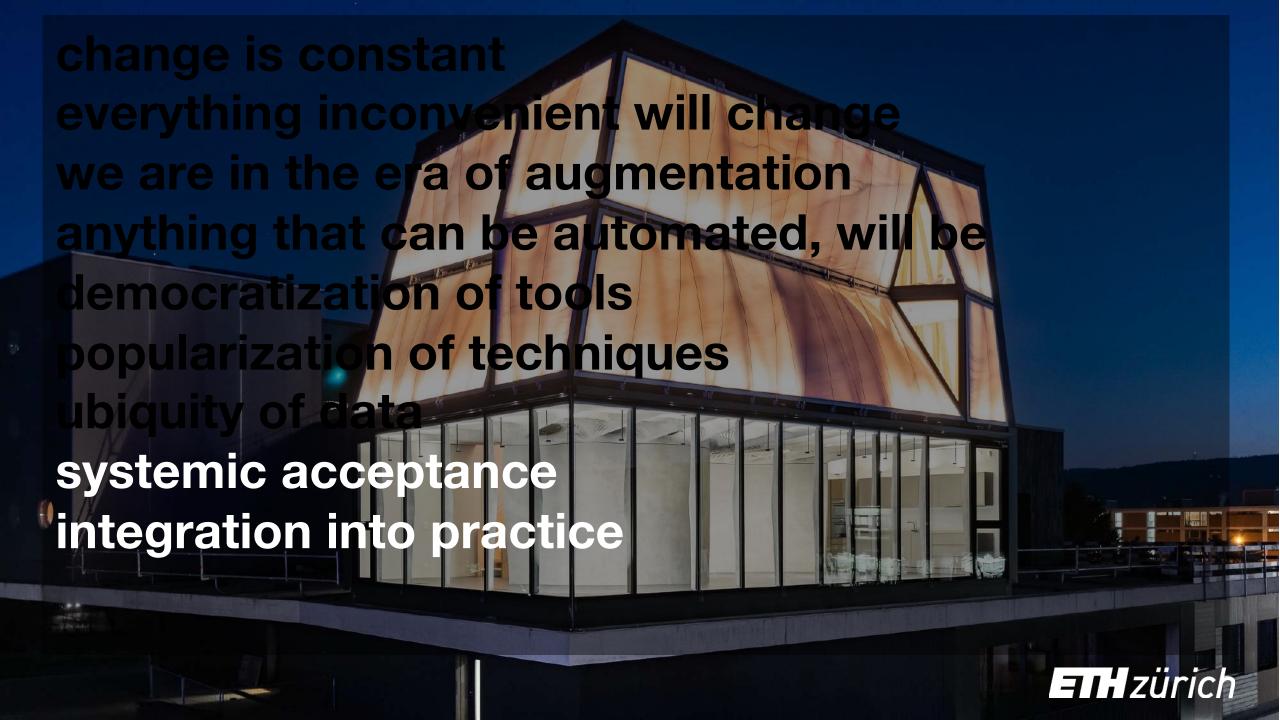


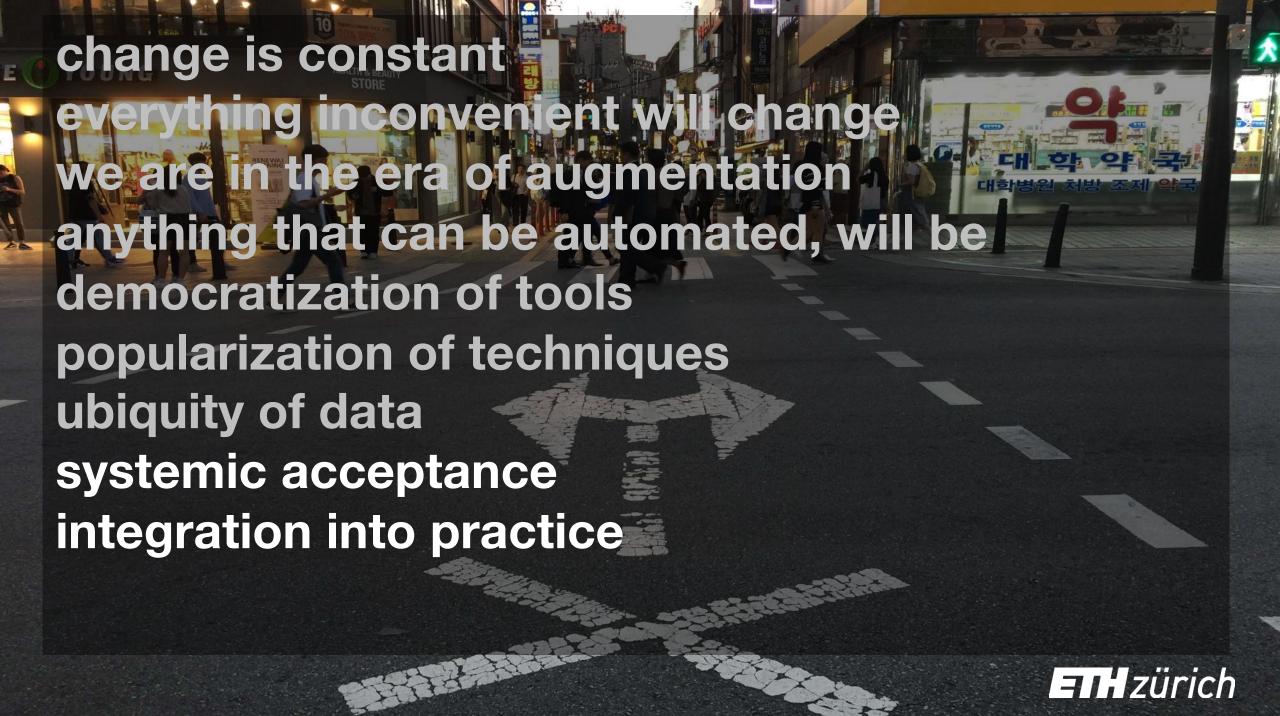


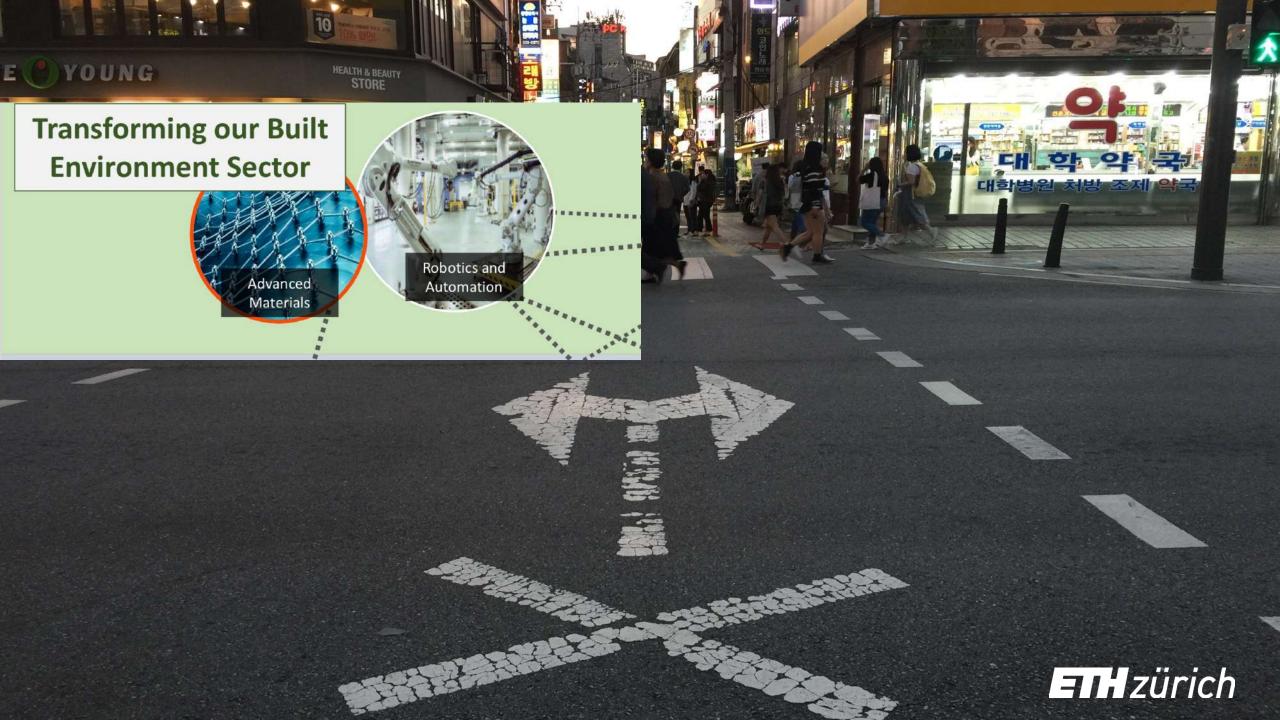


change is constant everything inconvenient will change anything that can be automated, will be democratization of tools popularization of techniques ubiquity of data



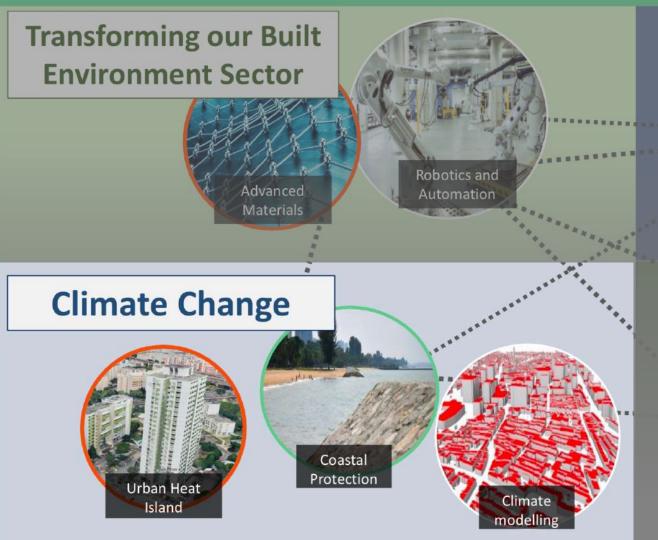






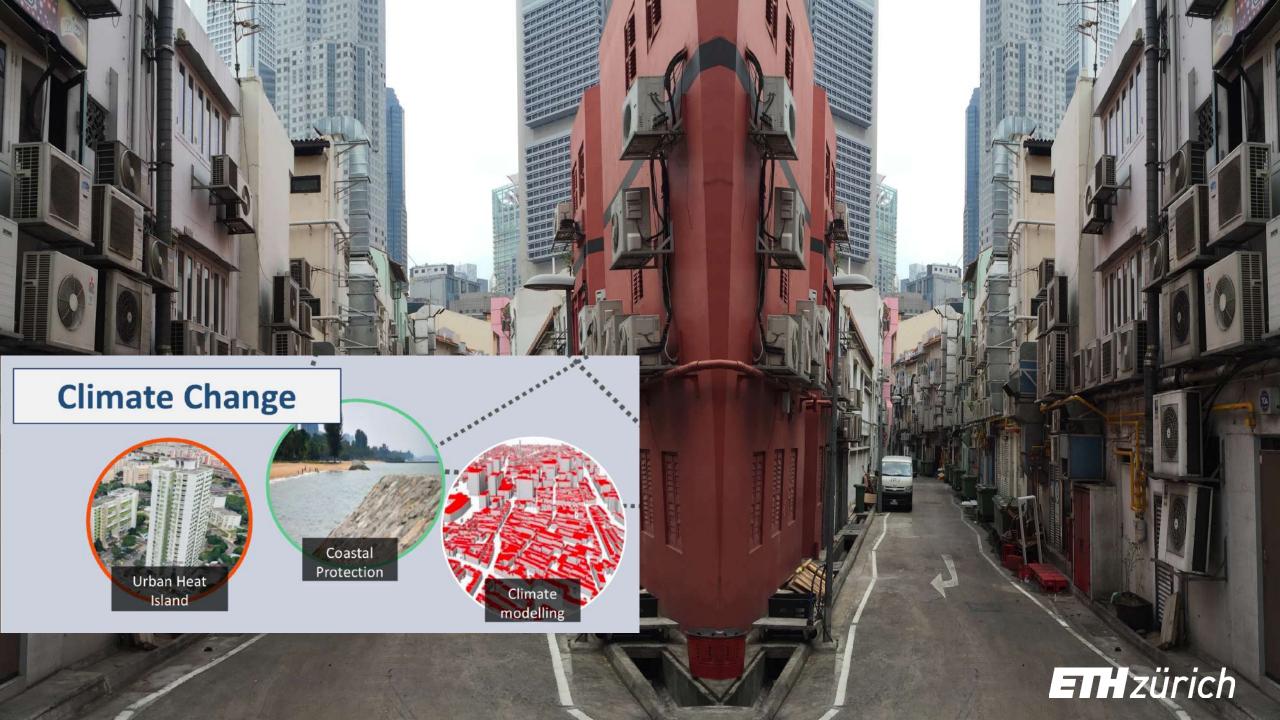
### **Game Changing Areas**

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## GLOBAL MEAN ANNUAL TEMPERATURE 1900

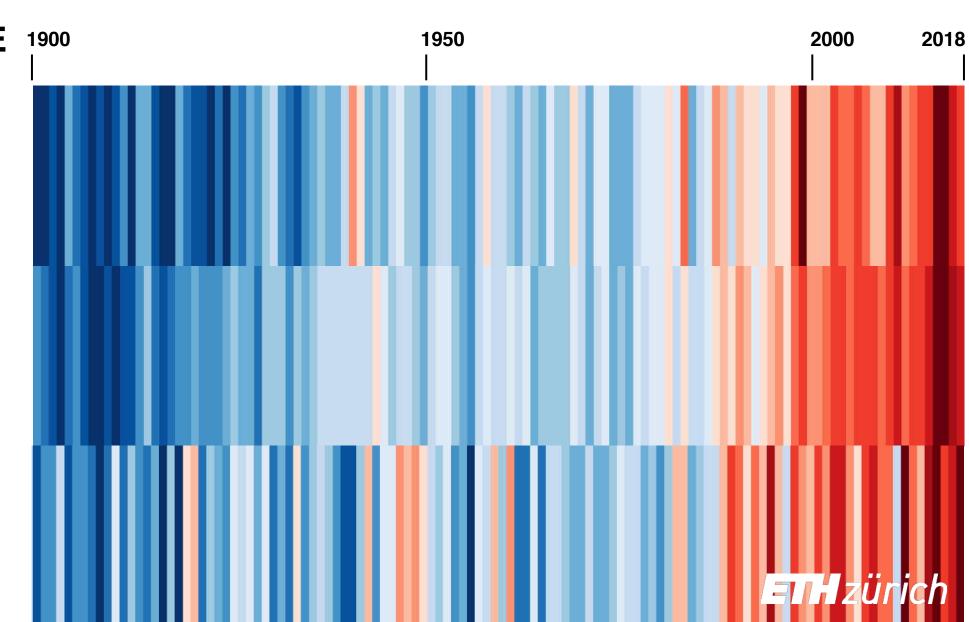
**SINGAPORE** (data from Berkeley Earth)

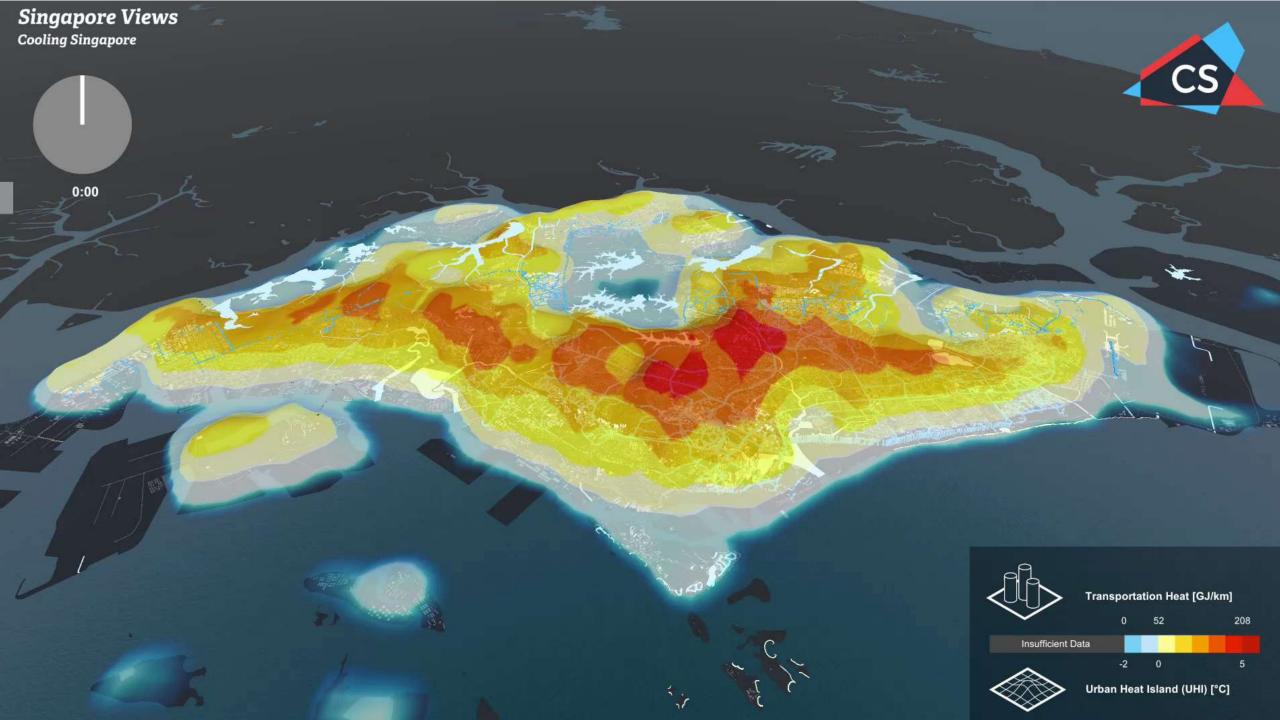
GLOBE (data from UK M

(data from UK Met Office)

**SWITZERLAND** 

(data from MeteoSwiss)





#### URBAN GEOMETRY

Sky view factor Aspect ratio Mean building/tree height **Building form** Variation between building heights Wider streets

Aviic obstruction Opel space along se shore Building porosity

**Building arrangement** Open spaces at road junctions Guide wind flows with urban elements Passive cooling systems Urban density by Local Climate Zones **Building Surface Fraction Green Plot Ratio Topography** 

#### **ENERGY**

Heat losses in buildings Energy efficiency of air-conditioning systems Energy efficiency of household appliances and office equipment **Energy efficiency of industries** Cooling load of buses Indoor temperature setting

Ventilation for heat releas to 2 r-conditioning

units Window-to-wall ratio **District Cooling** Renewable energy sources Heat recovery systems Mixed used neighbourhoods **Buffer zones** Hybrid ventilation in outdoor spaces

#### **VEGETATION**

Green roofs **Vertical greeneries** Green walls/facades Vegetation around buildings **Selective Planting Green pavements** Infrastructure greenery oscale urban greenin Green parking lots Tree species **Urban farming** Transport corridors

#### TRANSPORT

Vehicle population Public transport Centralised routing system **Active mobility** Electric private vehicles Electric public transport Autonomous mobility 1

Type o road mat circle Material and colour of cars

#### WATER BODIES

Cool sinks Blue and green spaces Wetlands Water catchment areas Ponds on roofs/ground floor **Evaporative cooling** 

di e or e n aucon

Shading on buildings Permanent shading devices Moveable shading devices **Smart shading devices** Shaded pedestrian spaces Shaded bicycle lanes

#### MATERIALS AND SURFACES

Cool pavements Permeable surfaces Photocatalytic cool pavements Cool roofs Cool facades Photocatalytic cool building envelope

**Desiccant systems** 

Vate or in faare system

Dynamic and active roofs

Dynamic and active facades or building components

**Building envelop performance** 







### DataSpark



































**VEOLIA** 







**BMW Motorrad** 



NANYANG TECHNOLOGICAL UNIVERSITY













SINGAPORE



PAUL SCHERRER INSTITUT































Building and Construction



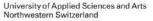












# (SEC) SINGAPORE-ETH CENTRE

The ETH Hub in Asia

Established by ETH Zurich & National Research Foundation Singapore

120+ researchers

100+ principal investigators

30+ scientific disciplines

20+ nationalities

300+ alumni

40+ academic, corporate & governmental partners

2020: Future Health Technologies



2014: Future Resilient Systems



2010: Future Cities Lab Global



F L O F L O























66

The future is green and healthy.
There is no alternative.

**Prof Dr Gisbert Schneider** 

0:00

**Design thinking** 

Constructive design

Artificial intelligence

**Learning from nature** 



Science

Engagement

Creativity



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Insufficient Data



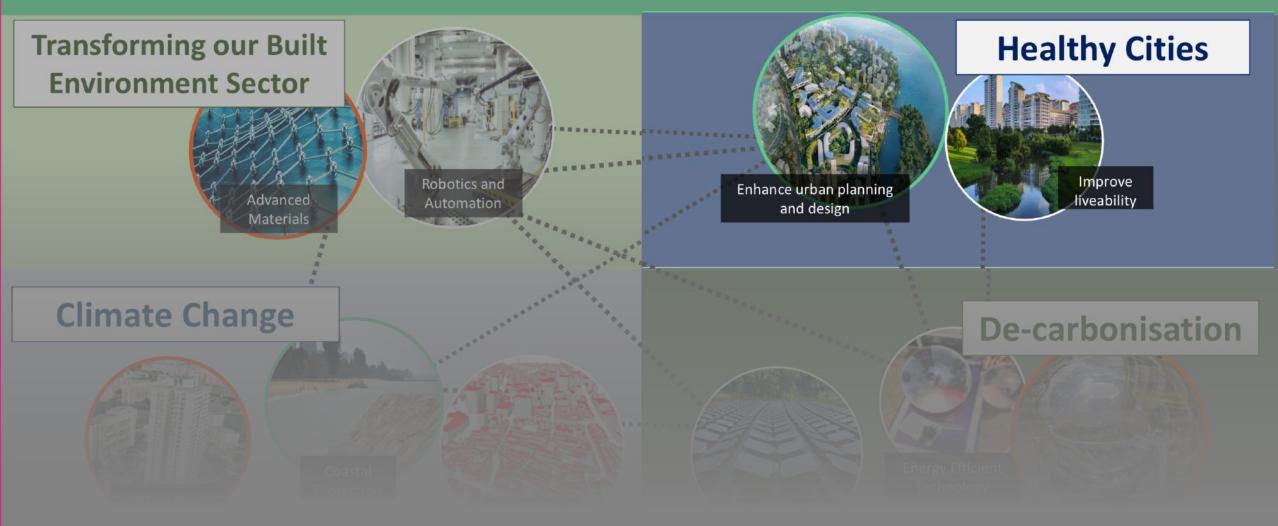
(SEC) SINGAPORE-ETH Urban Heat Island (PHI) [°C]



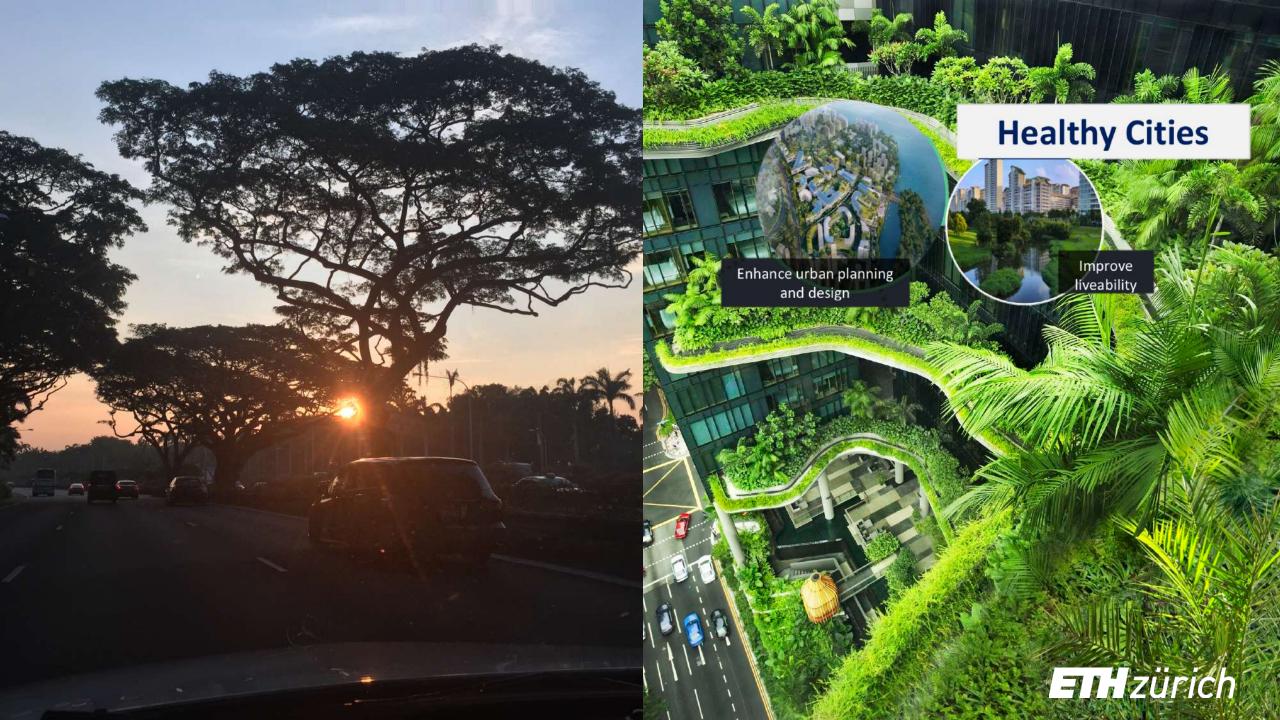


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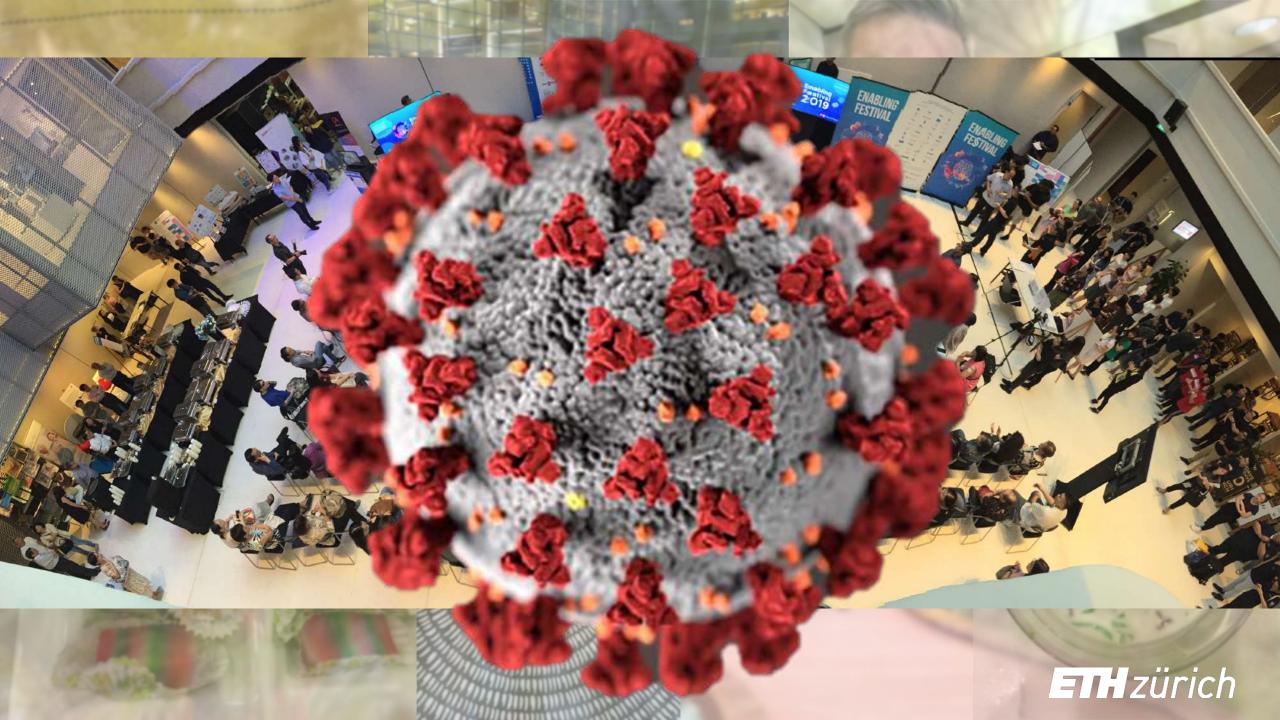






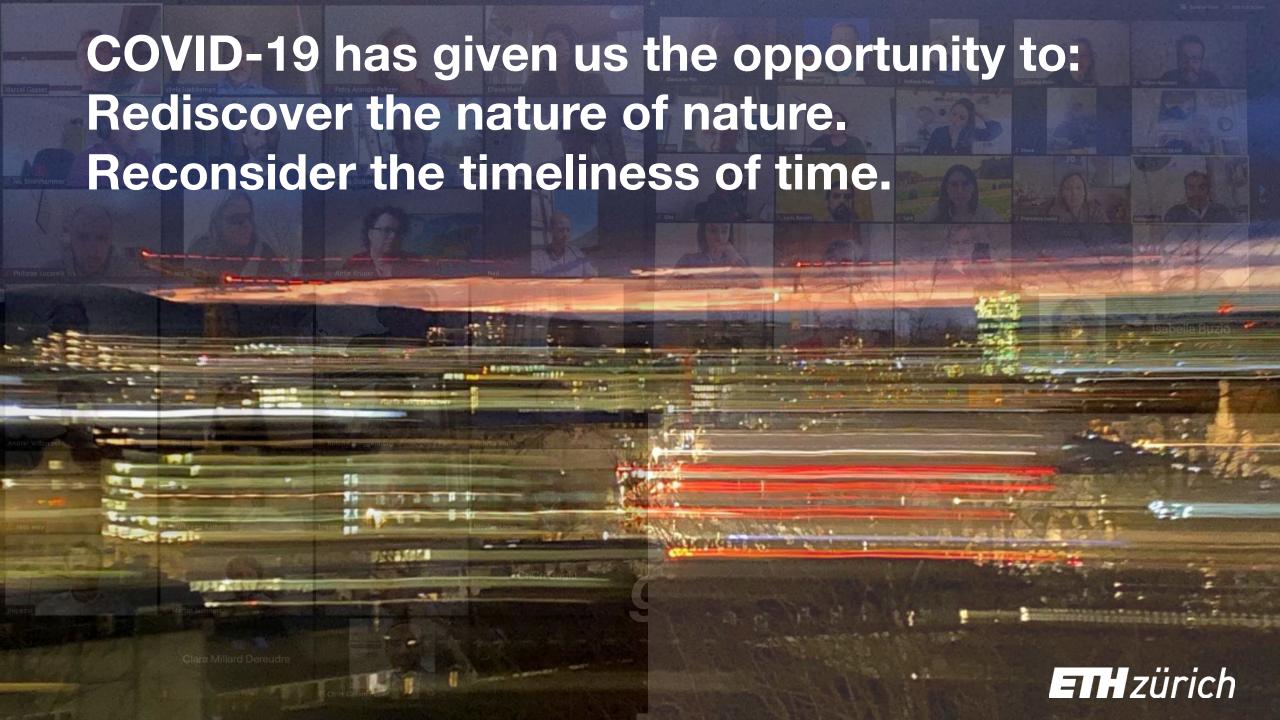


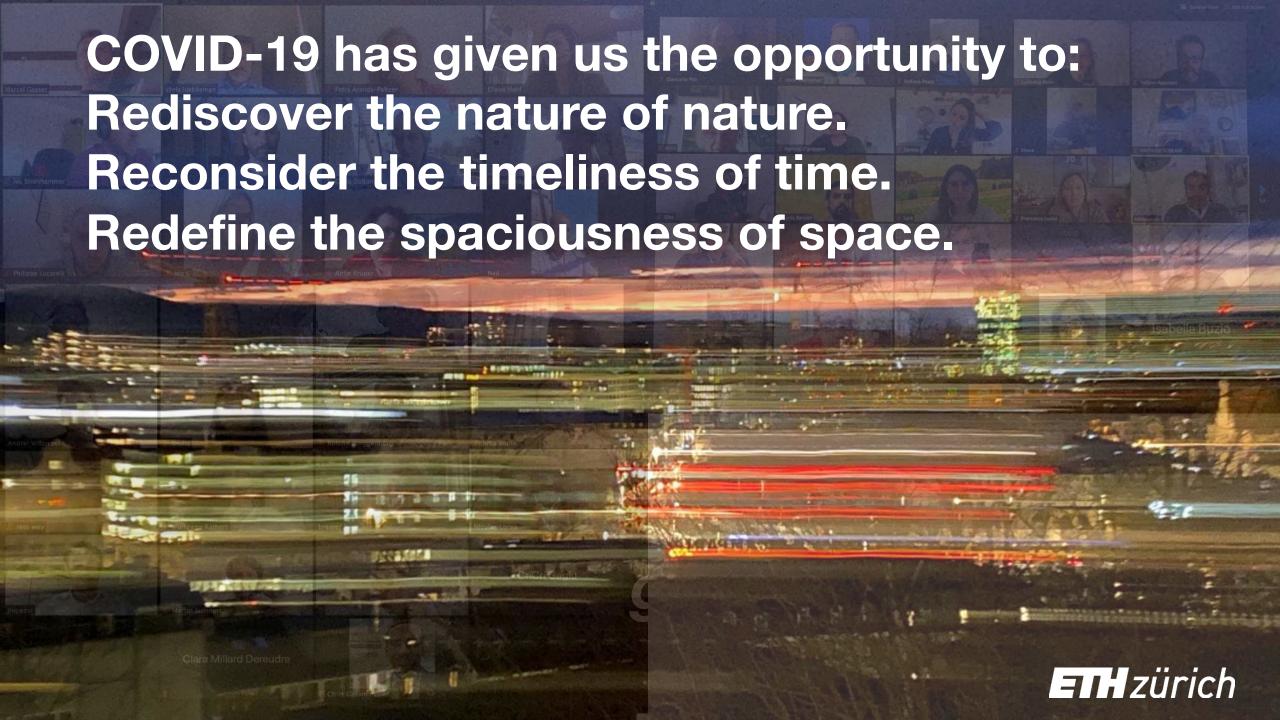


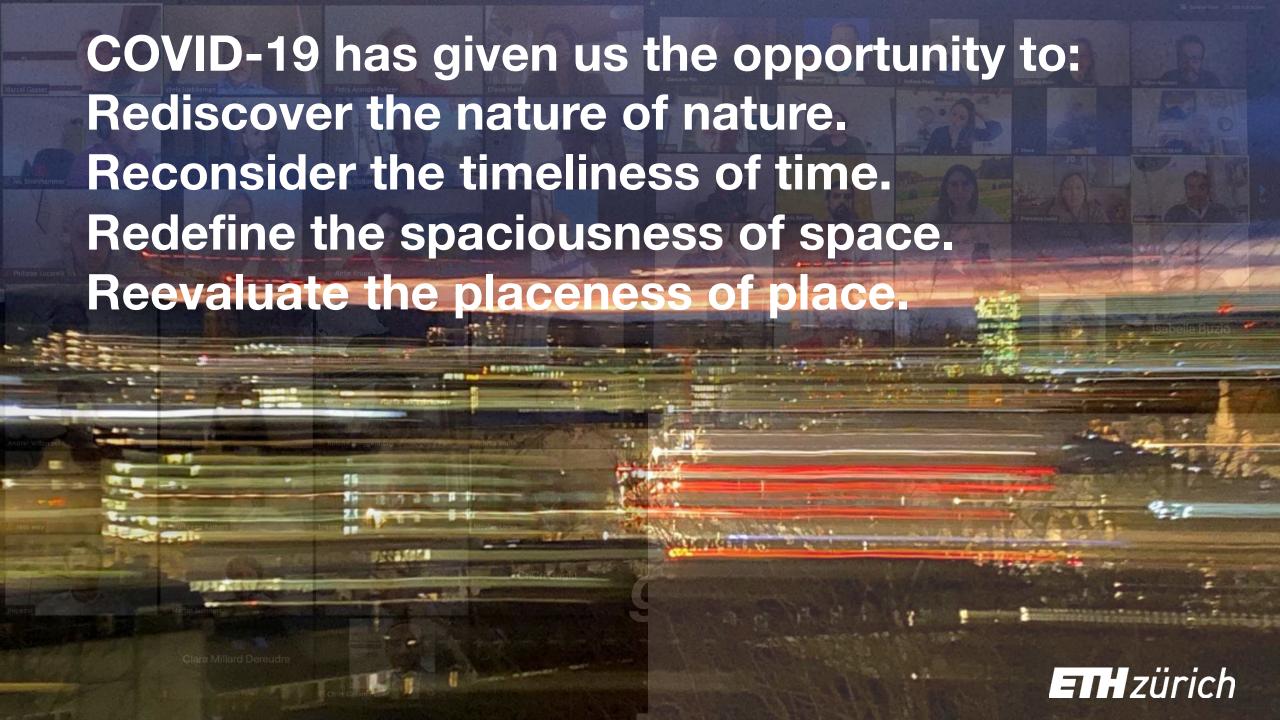


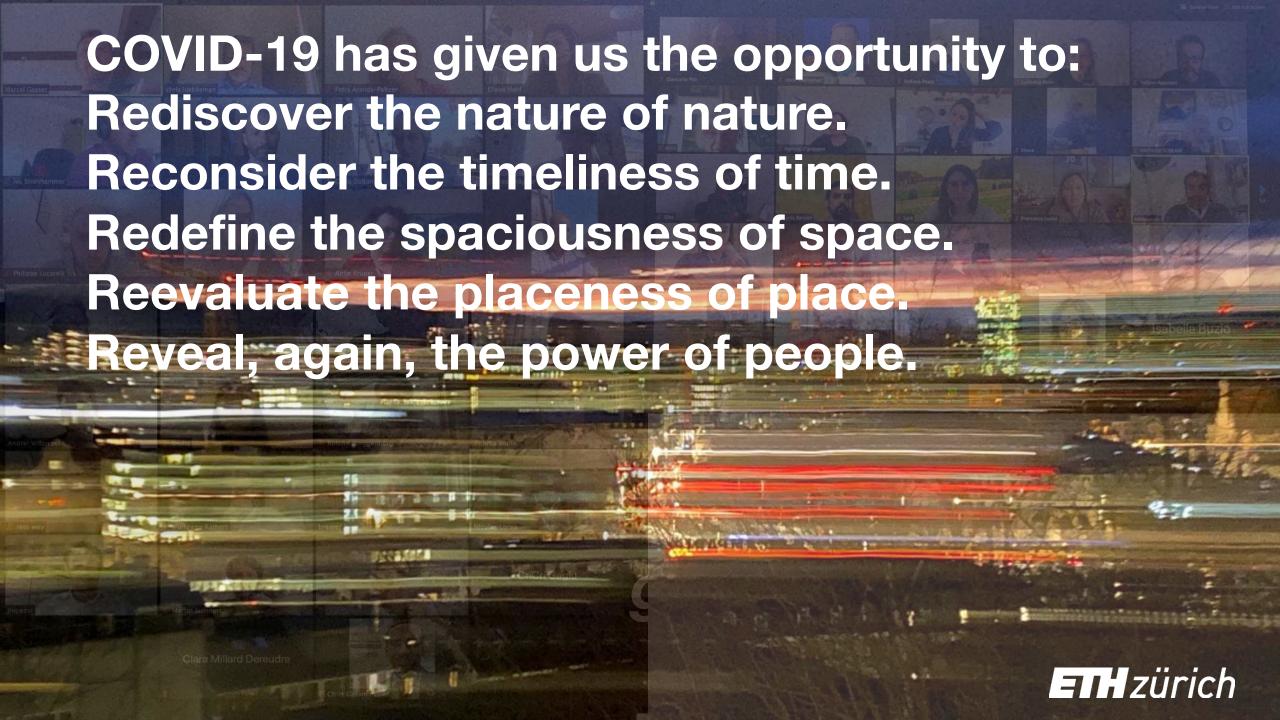


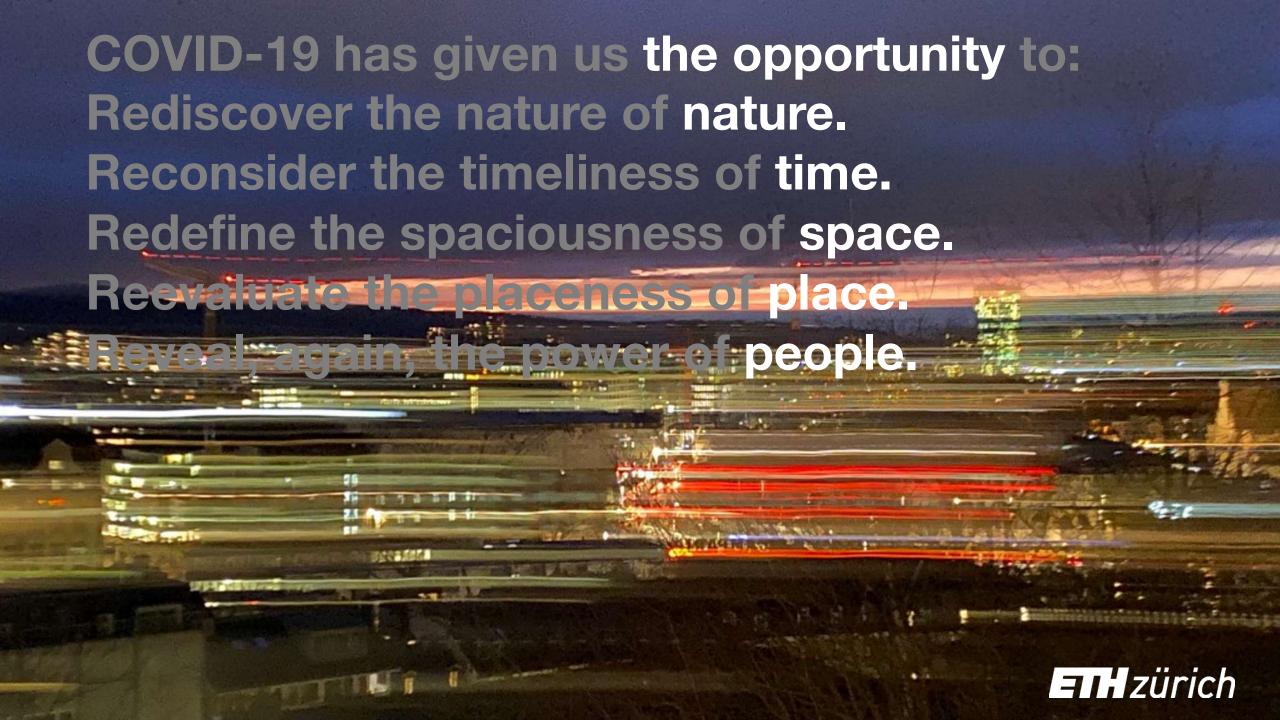












COVID-19 has given us the opportunity to: Rediscover the nature of nature. Reconsider the timeliness of time. Redefine the spaciousness of space. Reevaluate the placeness of place. Reveal, again, the power of people.



