

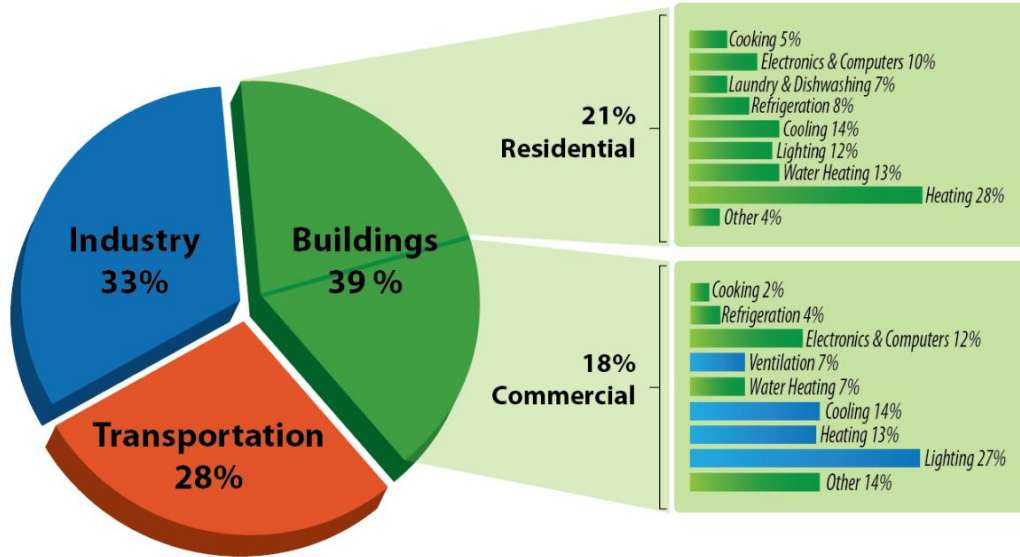
UYARLANABİLİR YAPI KABUKLARI İLE ENERJİ ETKİN BİNA TASARIMI

Dr. AYÇA TOKUÇ

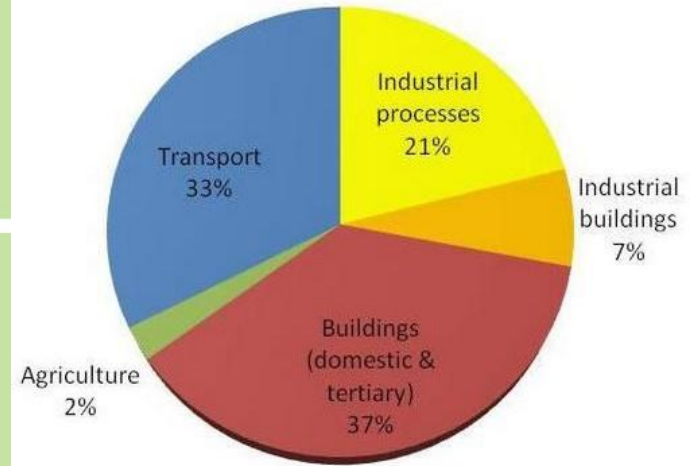
GÜNÜMÜZDE ENERJİ KULLANIMI

Günümüzde, nihai enerji tüketiminin %40'ı konut ve ticari/kamu binalarında gerçekleşmektedir.

ABD enerji tüketimi

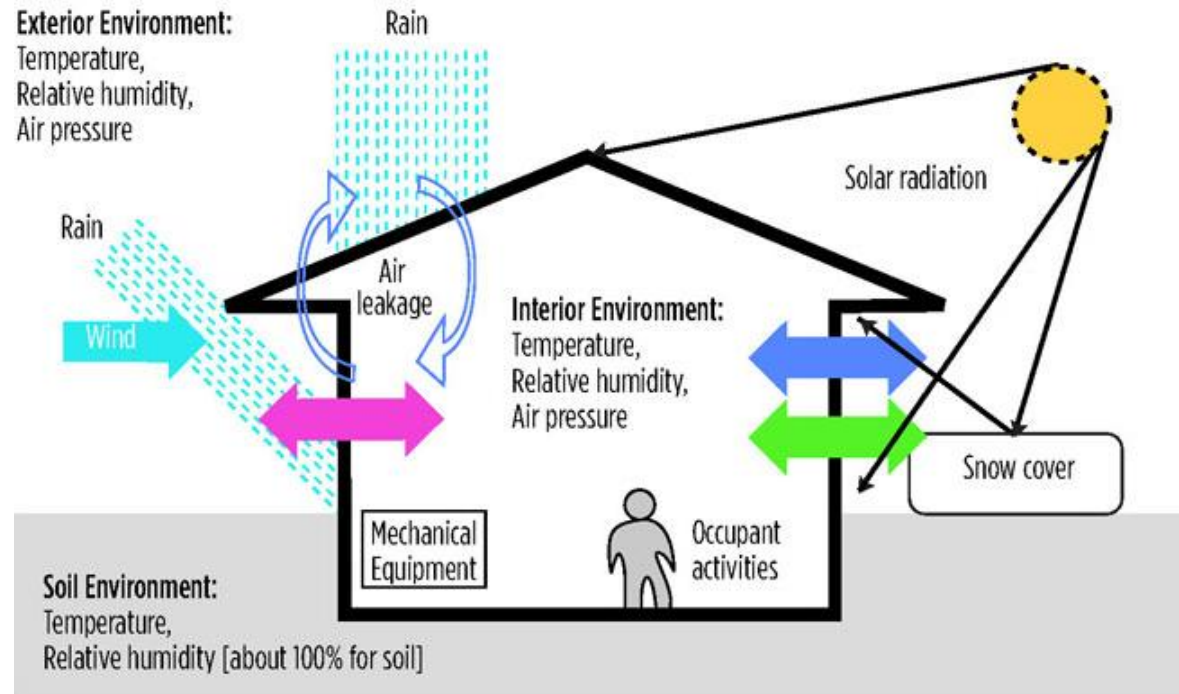


AB enerji tüketimi

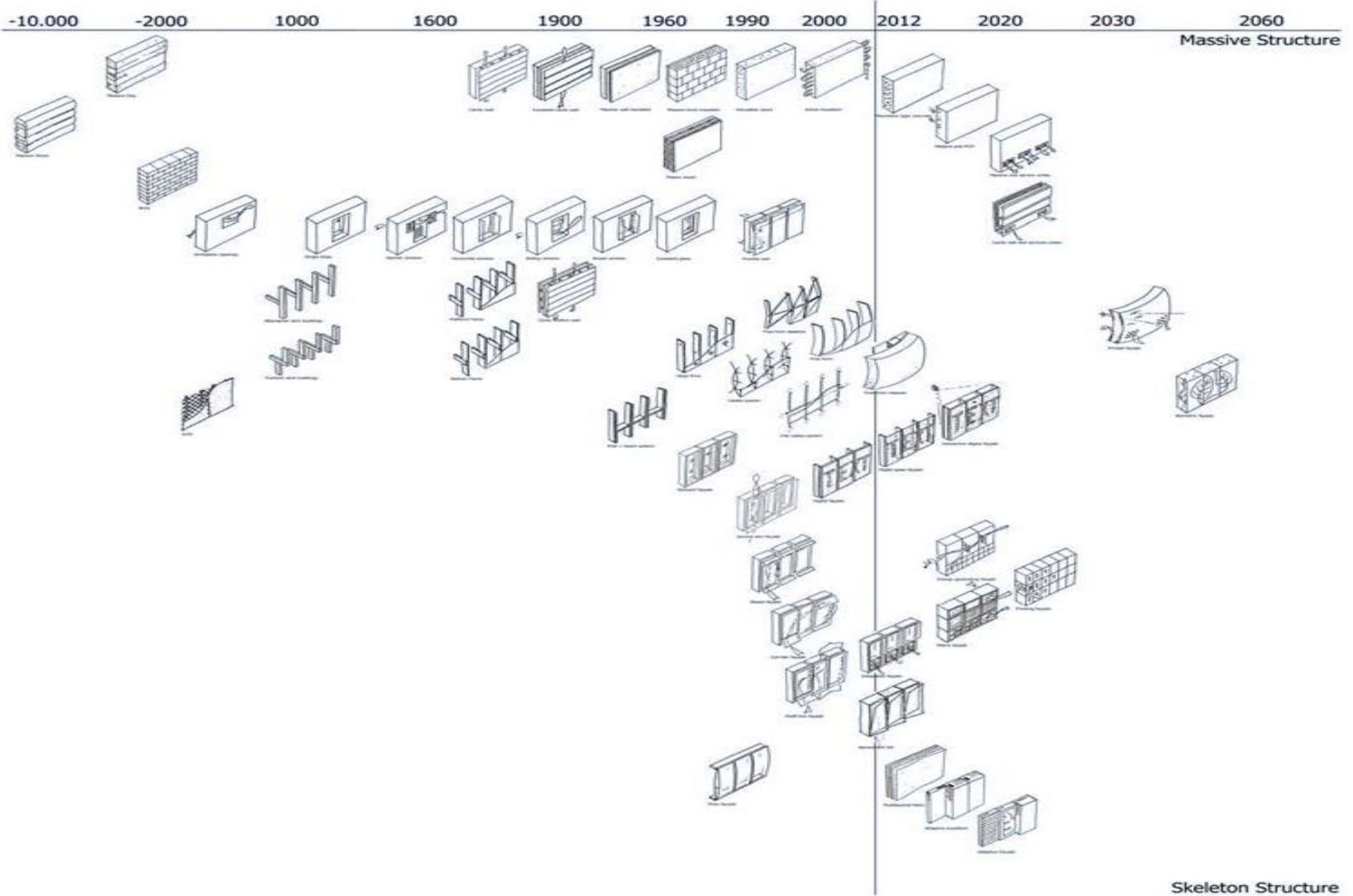


YAPI KABUKLARININ GÖREVLERİ

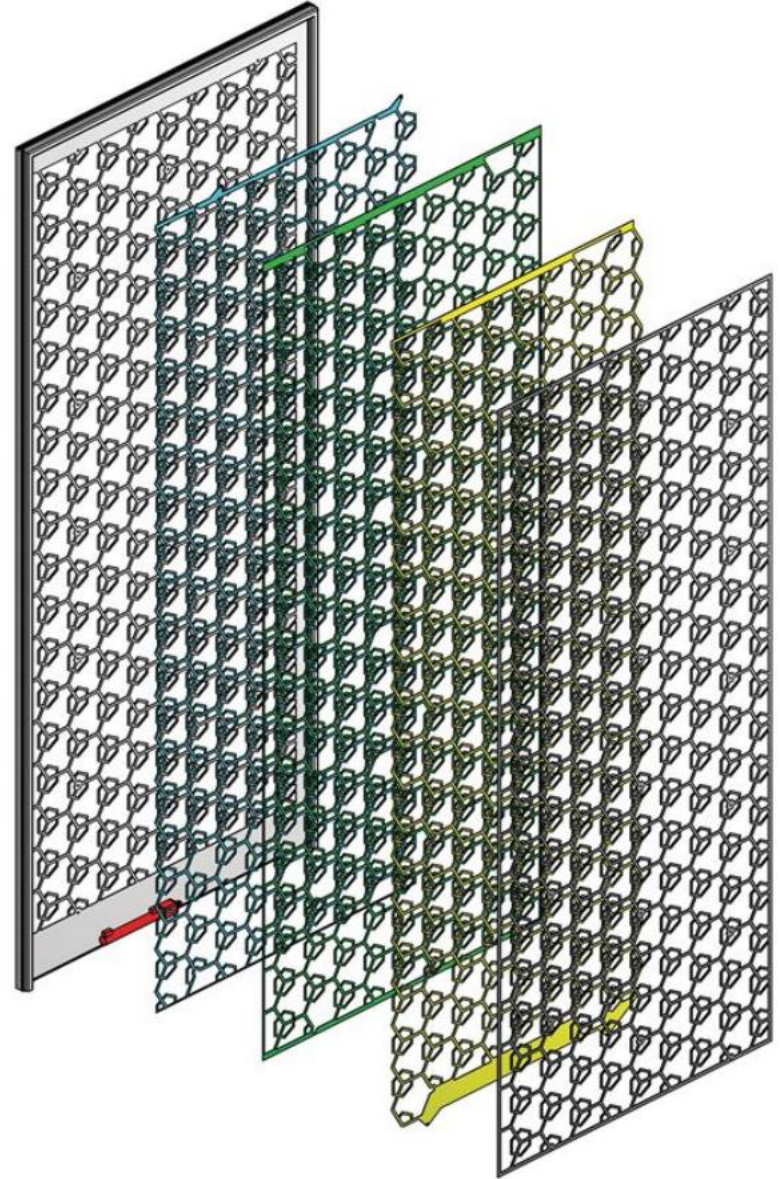
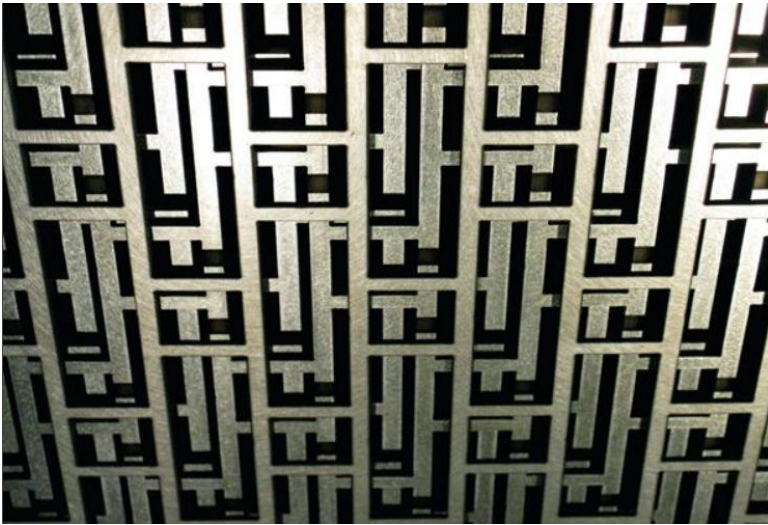
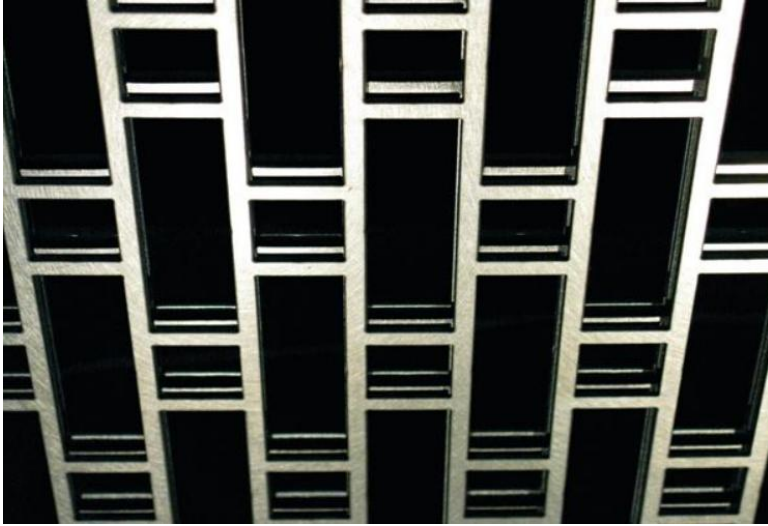
- **Isıl konfor**
- **Sıcaklık farkları**
- **Hava basıncı**
- **Buhar basıncı**
- **Görsel konfor**
- **Akustik**
- **Güvenlik**
- **Sismik yükler**
- **Estetik**



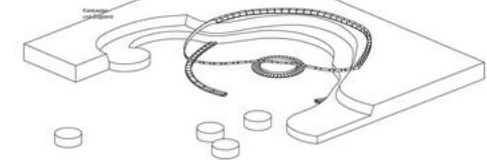
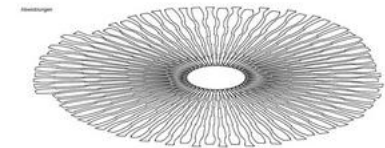
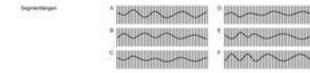
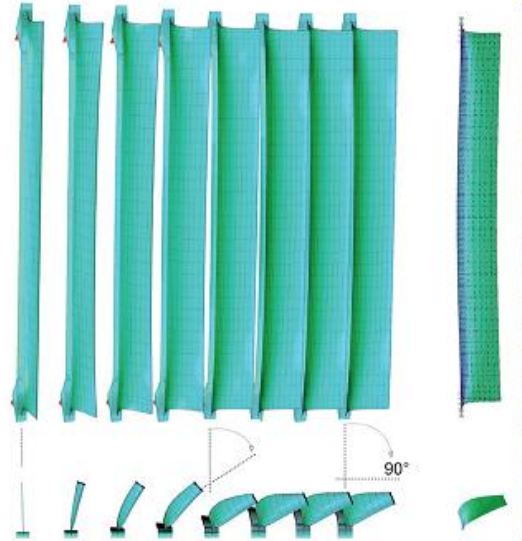
YAPI KABUKLARININ GELİŞİMİ



IŞIK DÜZENLEME



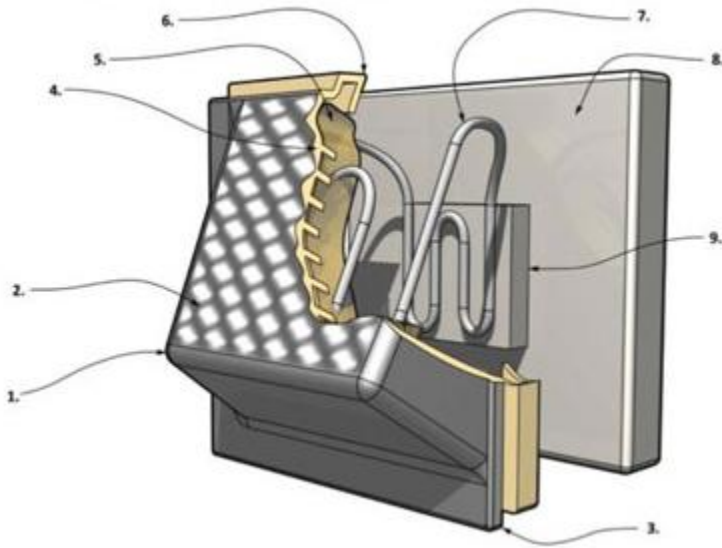
IŞIK DÜZENLEME - Flectofin



ISIL DÜZENLEME –Akışkan Hareketi

Seramik yapı kabuğunda

- yüzey morfolojisi
- entropi yönetimi
- enerji iletim görevi
- biyoanalitik tasarım ilkeleri



ISIL-IŞIK DÜZENLEME -Faz

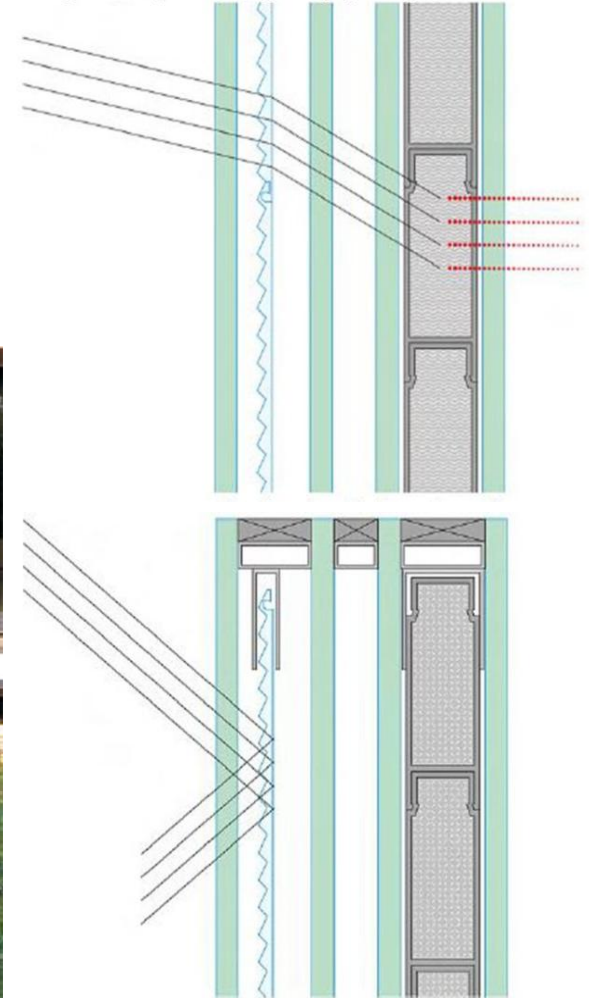
Değişimi

Kış koşullarında güneş $< 35^\circ$

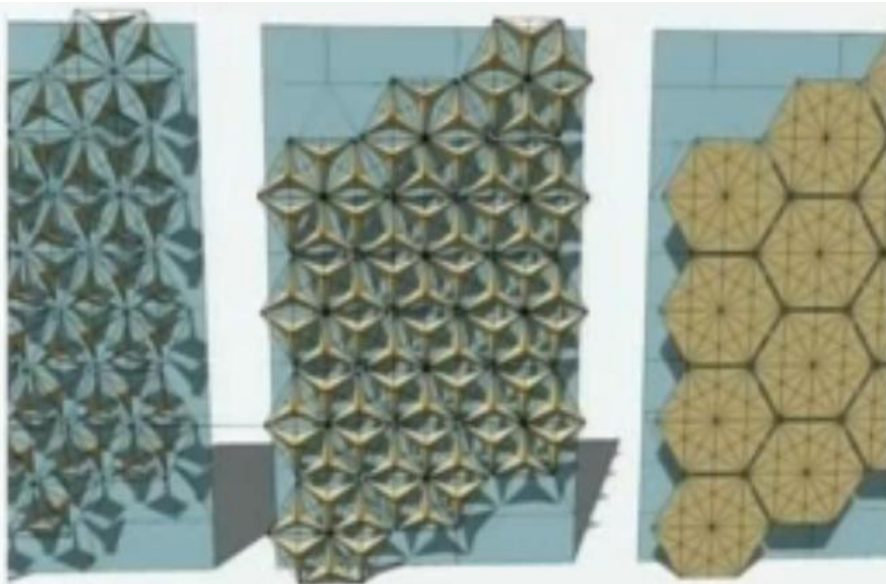
- doğrudan kayıpsız geçmekte

Yaz koşullarında güneş $> 40^\circ$

- Doğrudan güneş ışığı yansıtılmakta



ISIL-IŞIK DÜZENLEME –



<http://lavieboheme2010.blogspot.com.tr/2013/12/abu-dhabi-buildingswow.html>

www.youtube.com, CTBUH 2010 Mumbai Conference - Peter Oborn, "Dynamic Facades and Parametrics; New Vernacular?«

<http://www.evolo.us/architecture/abu-dhabi-investment-council-headquarters-towers-aedas-arup/>

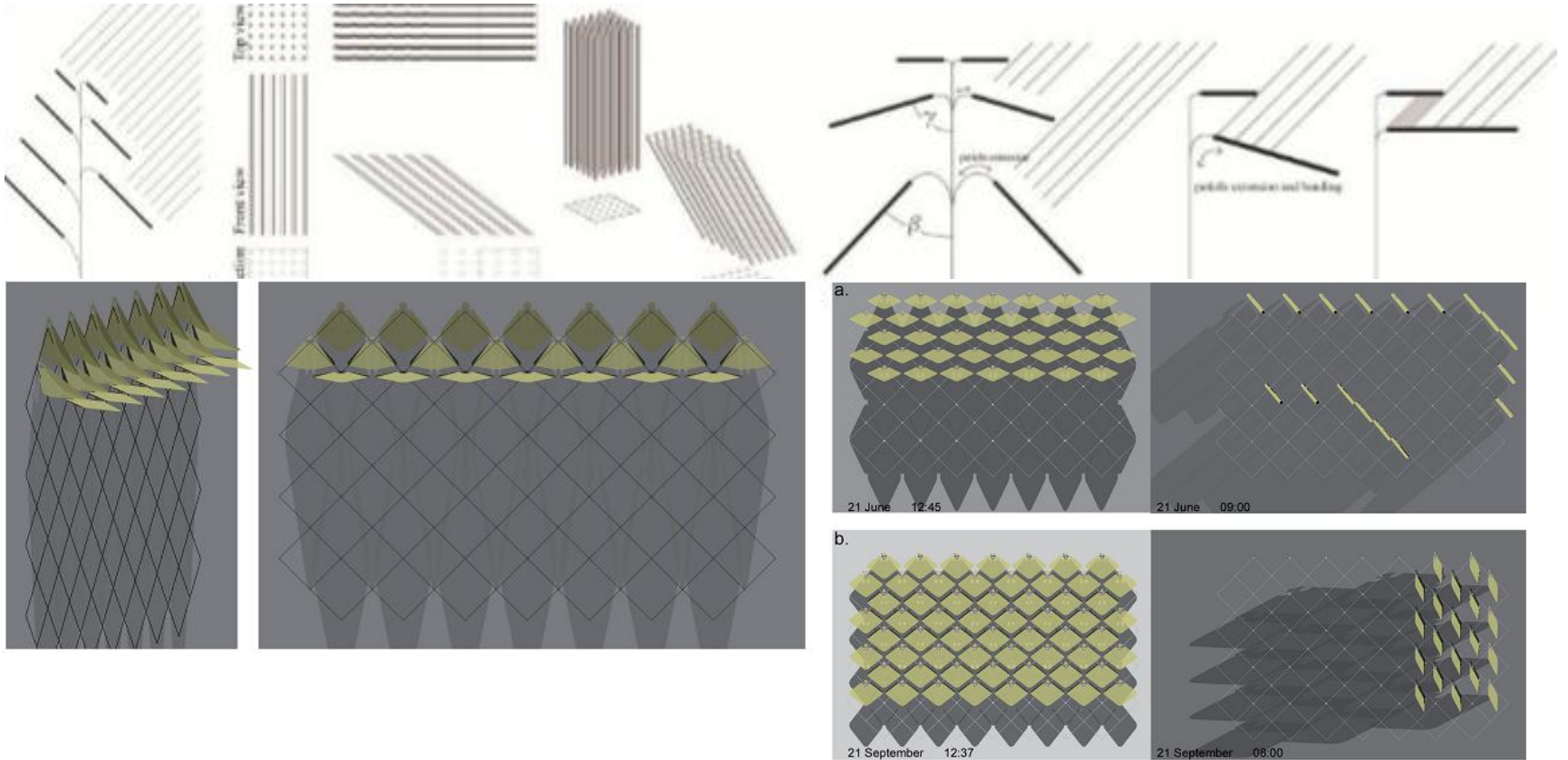
ENERJİ ÜRETİMİ –Cam PV



BIYONİK KABUK -1

Doğadan ilham alan biyonik bir kabuk

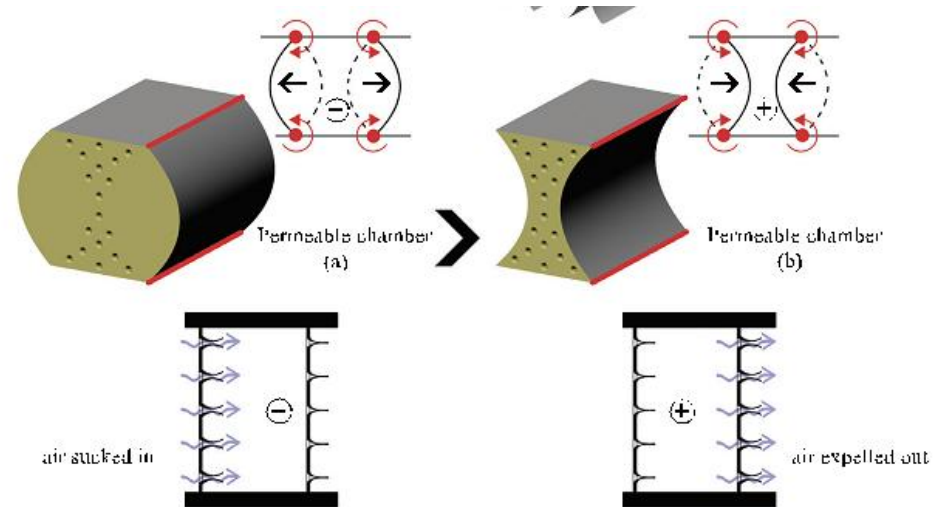
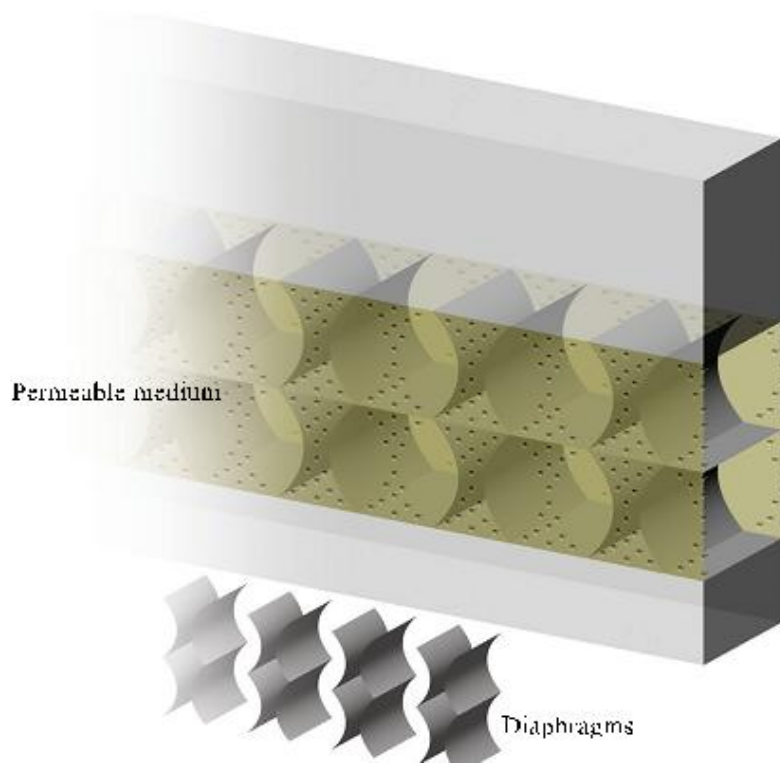
■ uyarlanabilir gölgeleme sistemi



BIYONİK KABUK -2

Doğadan ilham alan biyonik bir kabuk

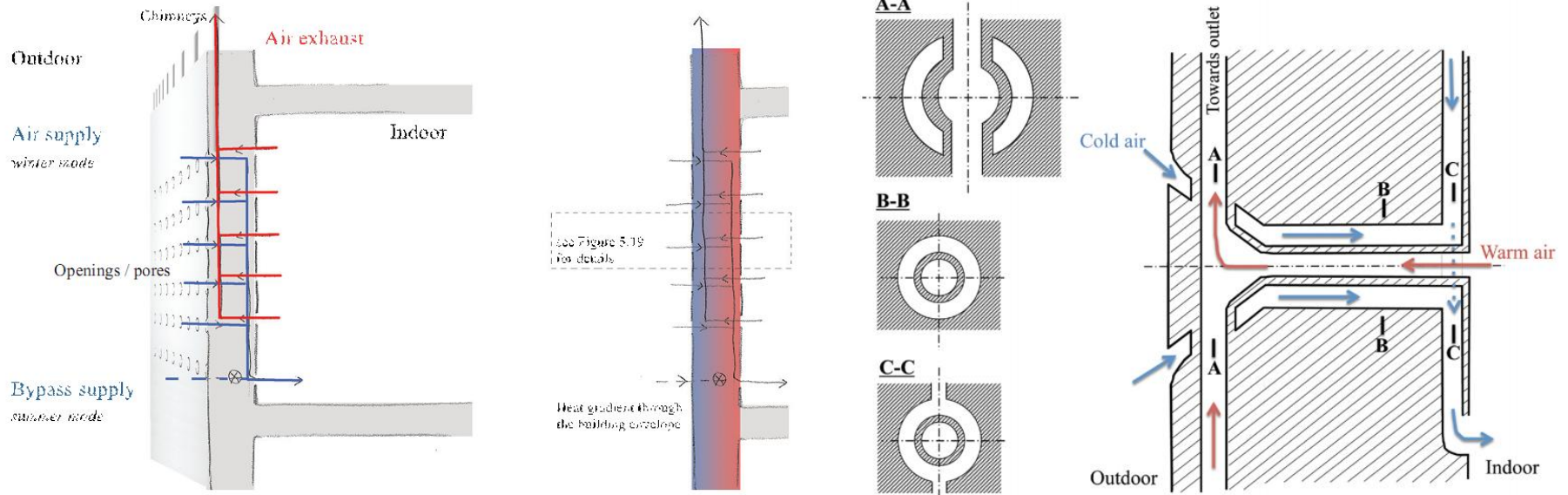
■ nefes alan kabuk



BIYONİK KABUK -3

Doğadan ilham alan biyonik bir kabuk

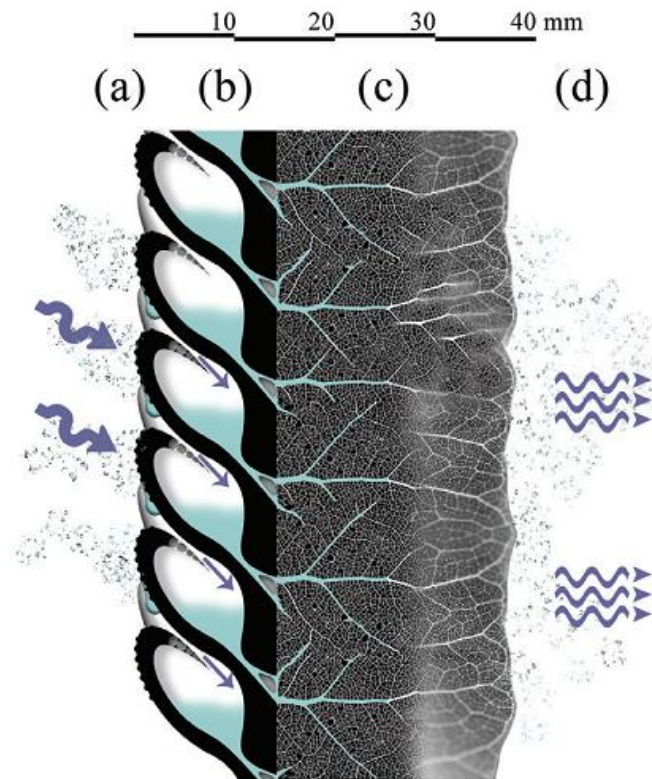
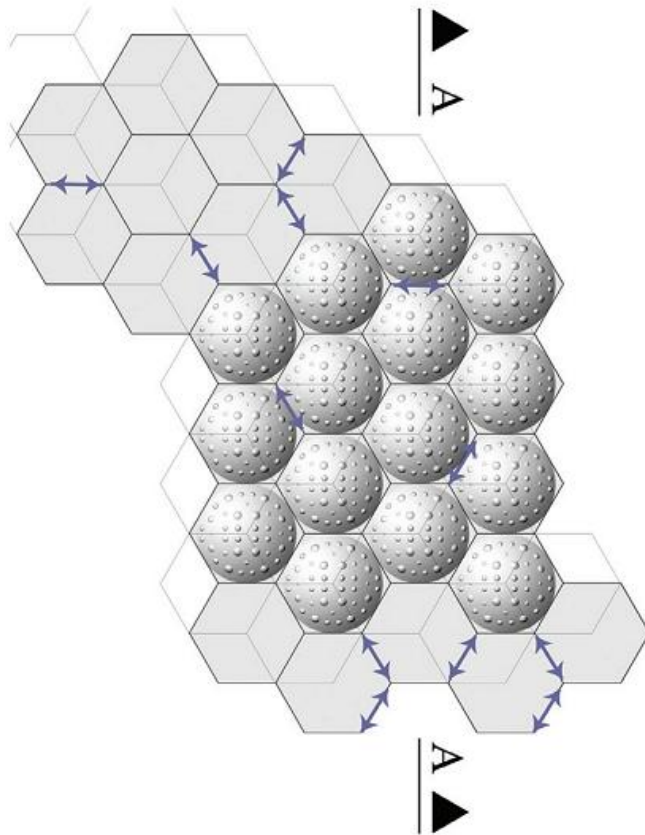
■ Isıl düzenleyici kabuk



BİYONİK KABUK -4

Doğadan ilham alan biyonik bir kabuk

■ su hasat eden kabuk



SONUÇ

Tasarım Aktörleri:

- **Mimar**
- **İnşaat mühendisi**
- **Makine mühendisi**
- **Cephe mühendisi**
- **Aydınlatma mühendisi**
- **Yapı fiziği uzmanı**
- **Enerji tasarım uzmanı**
- **Malzeme geliştiricisi**
- **Araştırmacılar**
- **Üreticiler**

İZMİR BÖLGESİ ENERJİ FORUMU - 2014

Teşekkürler...