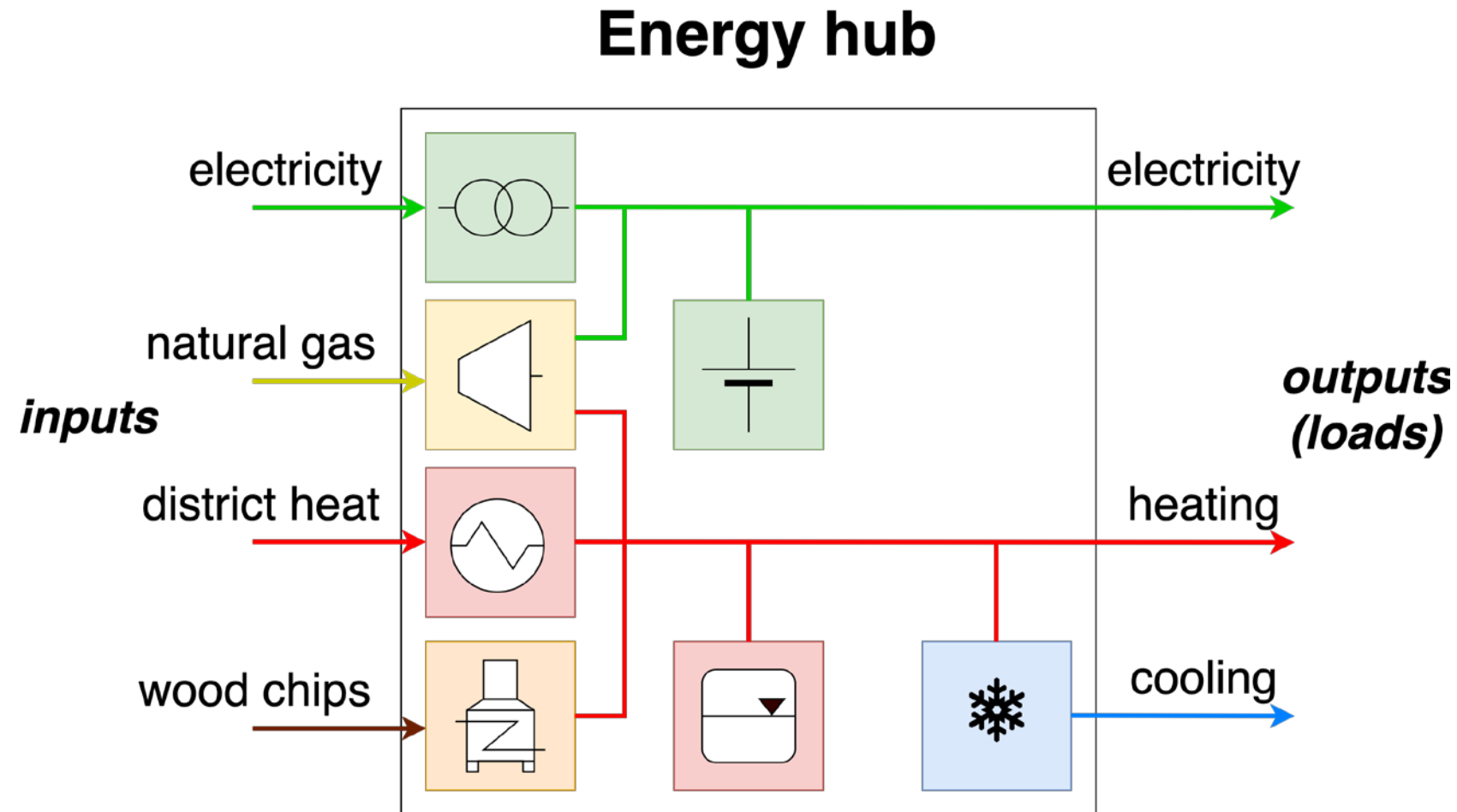


Energy Hubs

- Reflecting multi-energy systems
- Different energy carriers and systems interact together
- Requires a strong tools for integrated management



Energy Hubs – model

- Reflecting multi-energy systems
- Based on mathematical model



$$\begin{bmatrix} P_{\text{out}}^{\alpha} \\ P_{\text{out}}^{\beta} \\ \vdots \\ P_{\text{out}}^{\zeta} \end{bmatrix} = \begin{bmatrix} c_{\alpha\alpha} & c_{\beta\alpha} & \cdots & c_{\zeta\alpha} \\ c_{\alpha\beta} & c_{\beta\beta} & \cdots & c_{\zeta\beta} \\ \vdots & \vdots & \ddots & \vdots \\ c_{\alpha\zeta} & c_{\beta\zeta} & \cdots & c_{\zeta\zeta} \end{bmatrix} \begin{bmatrix} P_{\text{in}}^{\alpha} \\ P_{\text{in}}^{\beta} \\ \vdots \\ P_{\text{in}}^{\zeta} \end{bmatrix}$$

output power vector

coupling matrix

input power vector