

Fig. 1. Performance of the proposed method in smart city

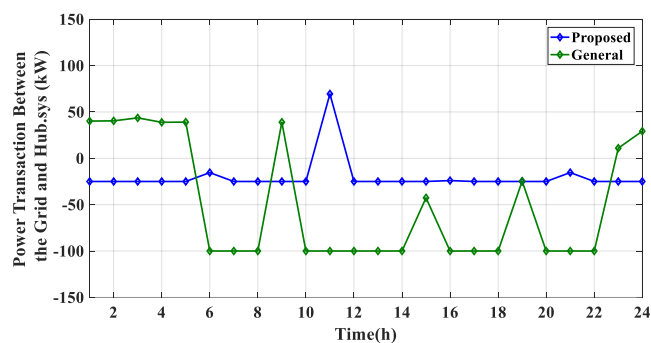


Fig. 2. Comparative result for the grid and hub system.

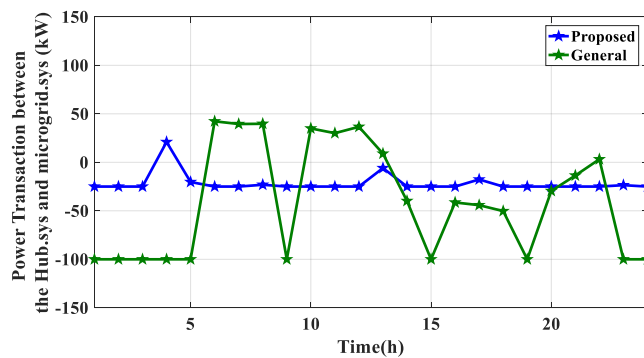


Fig. 3. Comparative result for the hub and microgrid system.

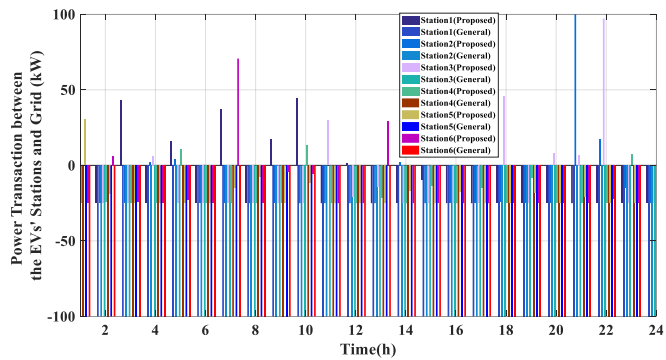


Fig. 4. Comparative result for the grid and transportation system.

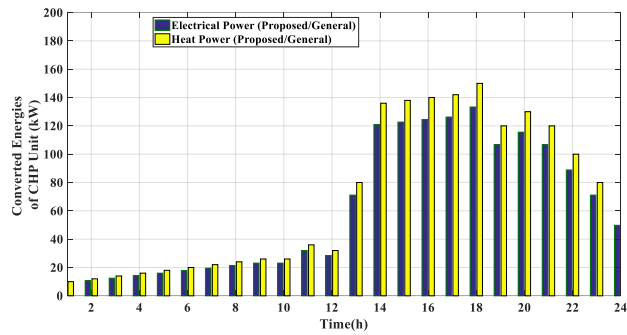


Fig. 5. Heat/electrical Outputs of CHP unit

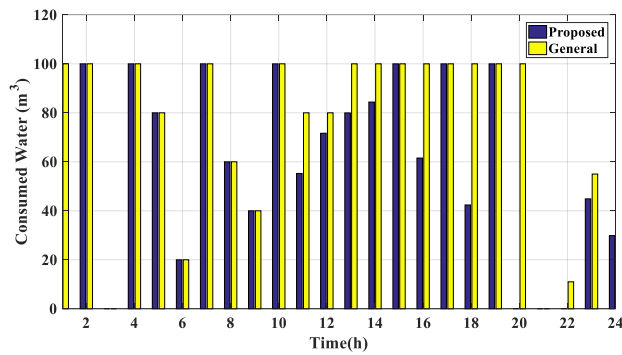


Fig. 6. The water consumption of hub system.

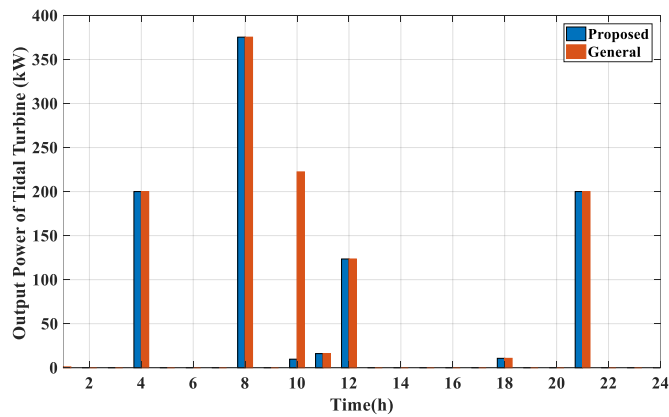


Fig. 7. The generated power of tidal turbine.

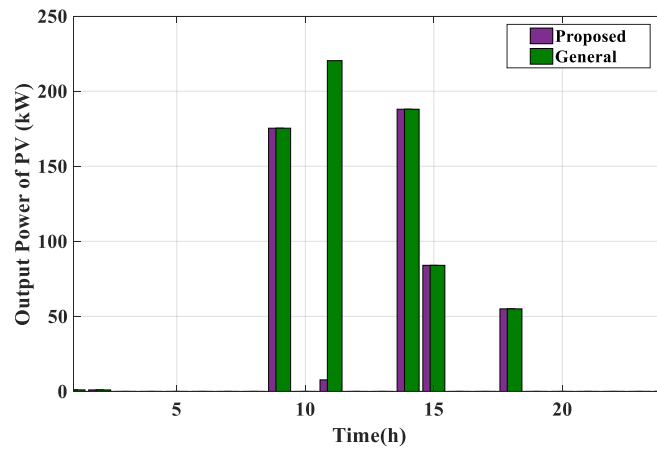


Fig. 8. The generated power of PV.

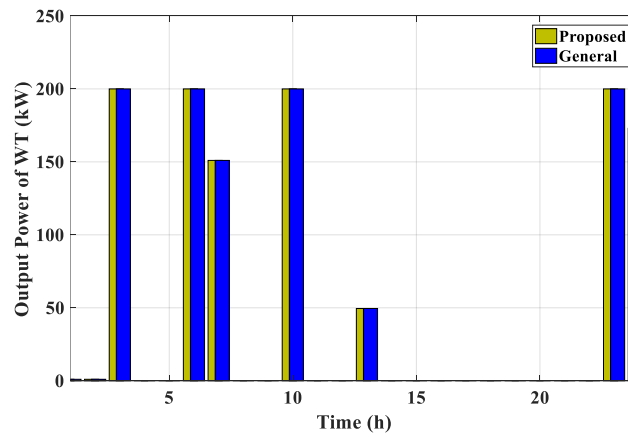
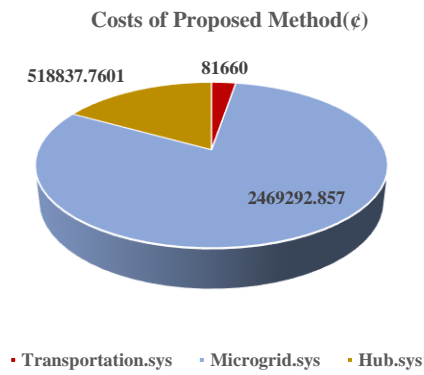
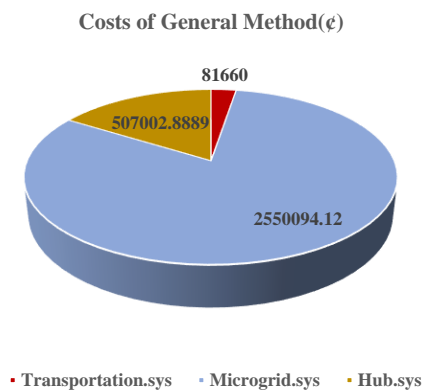


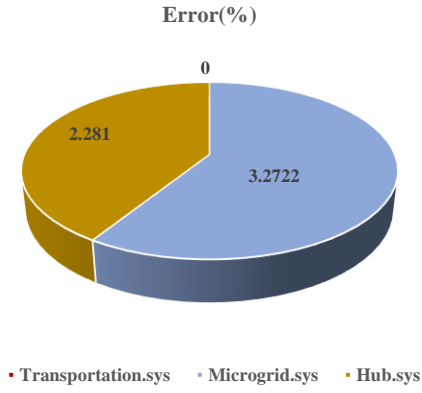
Fig. 9. The generated power of WT.



(a)



(b)



(c)

Fig. 10. The costs: a) the proposed method b) general method c) error percentage.

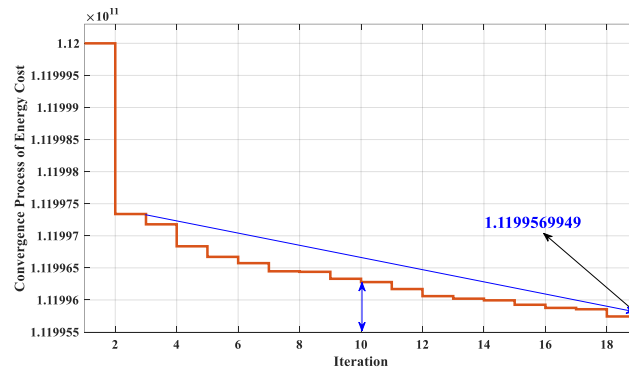
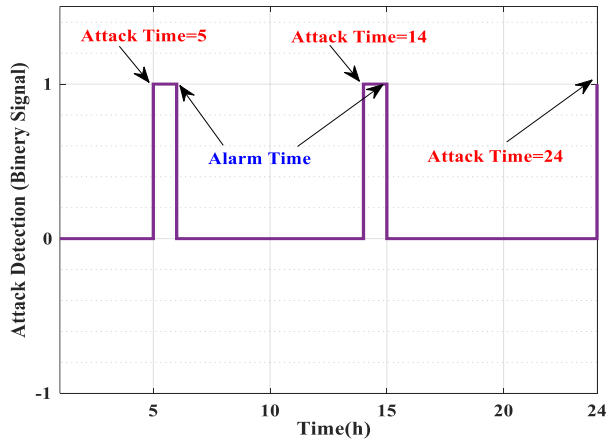
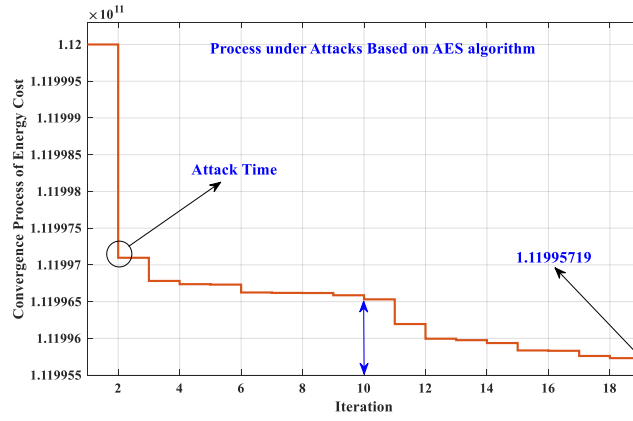


Fig. 11. The consensual energy cost of studied smart city based on the proposed method without cyber-attacks.



(a)



(b)

Fig. 12. The consensual energy cost of studied smart city based on the proposed method with two cyber-attacks at various hours: a) detected the cyber attacks by AES algorithm b) convergence process of energy cost

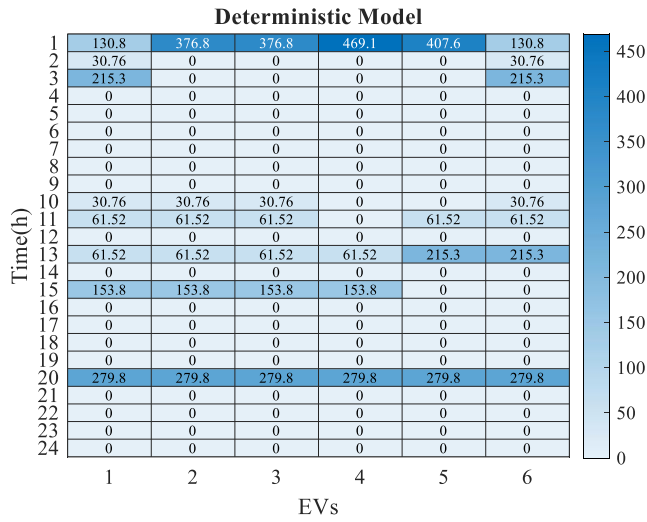


Fig. 13. The outcome of deterministic energy management in smart city.

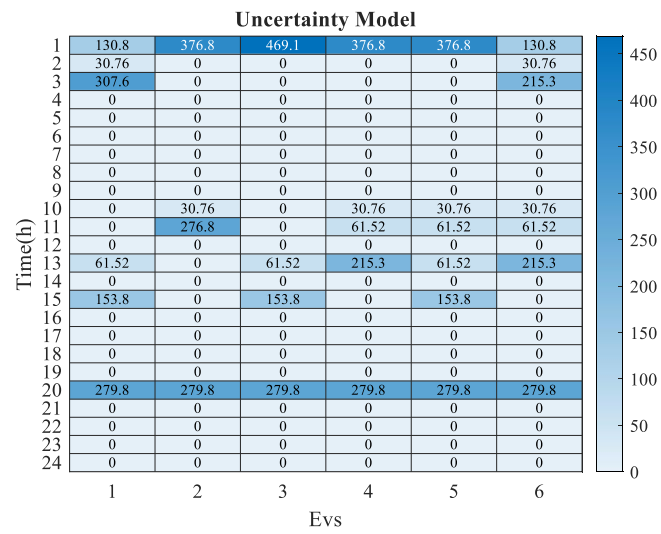


Fig. 14. The outcome of uncertainty energy management in smart city