reduce the energy usage on mobile devices. Averagely, about 26.8% of energy usage might be preserved. The equation $e\beta case = \sum \left(\frac{(eL\delta) + (eM\delta) + (eH\delta)}{e\delta(n)} \right)$ Where eβcase is an experiment of energy-based of the case study, eLδ, eMδ and eHδ is total case study δs energy consumption. In Figure 7, the result shows the average energy consumption in δs. That average of power profiling model used less energy rather than without a power profiling model. With power profiling model, the energy usage significantly reduces almost 28 % differ from regular without power profiling usage. It uses almost 30% of energy consumption on smartphone devices. The energy usage of the entire system loses when the video apk initiates energy adaptation approaches. This framework can be implemented within the mainstreaming application, such as Youtube and Vimeo. For this framework to work with the application there should be some of the alterations on how video streaming can be manipulated. Moreover, it will sit on the server-side of mainstreaming server if available. This approach is reliable as the experiment process used a similar concept. In addition, by setting an experiment on energy efficiency show the significance reduces energy consumption. Since PowerDoW framework is a set of process and instruction, hence, it also possible to implemented and embedded on OS as well.

IV. CONCLUSION

Generally, in any research being conducted, it will have some constraints. In this paper, the main limitation is to form a suitable energy model that will fit with any devices, scenarios, and environments. This research tried to proposed video content adaptation and implemented into the framework of PowerDoW approaches. Basically, there is a lot of improvement that can be made in order to enable the adaptation of the energy function. Next, this section comprises several improvements that can be implemented within this area. User Quality of Experience (QoE). Essentially, user behaviours and reaction play the main role when it comes to reducing energy consumption in smartphone devices. The user QoE that can expect user actions and determine the best solution towards energy management and user preferences. User QoE ought to estimate the user desire in order to give the best outcome for their video streaming that satisfy both QoE and energy in the smartphone device. In future work, research on user QoE is highly necessary or compulsory and must be considered for fully designing the best energy-aware policies for video streaming application or session. Policies of Energy-aware. Since more update on Android OS, it is difficult to design energy-aware policies in order to support energy adaptation. We need to create a universal profiling algorithm that caters to both energies on video content adaptation within an application device. This objective requires the policies to not only be good at lessening energy consumption for video content streaming, nevertheless, also considering the variance of each video application. Remote content adaptation engine provides a read-time choice measurement for media prediction in video streaming. In order to find the best solution for video attribute, it must be triggered automatically to find good video attributes being implemented in the server.

REFERENCES

[1] Amine, D., Elmiligi, H., Gebali, F., *Energy Bugs in Mobile Devices: A Survey*. IEEE Pacific Rim Conference on Communications, Computers and Signal Processing (PACRIM) 2015.

[2] Ballesteros, L.G.M., Ickin, S., Fiedler. M., Markendahl, J. *Energy Saving Approaches for Video Streaming on Smartphone based on QoE Modeling*. 13th IEEE Annual Consumer Communications & Networking Conference (CCNC), 2016.

[3] Dragiü, L., Hofman, D., Kovaþ, M., Žagar, M., Knezoviü., J. *Power Consumption and Bandwidth Savings with Video Transcoding to Mobile Device-specific Spatial Resolution*. 9th International Symposium on Communication Systems, Networks & Digital Sign (CSNDSP) 2014.

[4] Ismail, N.M., Ibrahim, R., Fudzee, M., F. A Survey on *Content Adaptation Systems towards Energy Consumption Awareness*. Hindawi Publishing Corporation, Advance in Multimedia Volume 2013 - 8page, 2013.

[5] Khan, S., Schroeder, D., Essaili, E., A., Eckehard, S. *Energy-efficient and QoE-driven adaptive HTTP streaming over LTE*. IEEE WCNC'14 Track 3 (Mobile and Wireless Networks) 2014.

[6] Zheng, Q., Du, H., Li, J., Zhang, W., Li, Q. *Open-LTE: An Open LTE Simulator For Mobile Video Streaming*, IEEE International Conference on Multimedia and Expo Workshops (ICMEW) 2014.

[7] Aqil. A., Ahmed O. F.., A ∗, Srikanth., V. K., ∗, Papageorgiou. Streaming Lower Quality Video over LTE: *How Much Energy Can You Save?* IEEE 23rd International Conference on Network Protocols 2015.

[8] Oche, N., Saleem, N. B. Go Green with *EnVI: The Energy-Video Index*. IEEE International Symposium on Multimedia 2015.

[9] Fudzee, M., F, and Abawajy., J. *A protocol for discovering content adaptation services*. Algoriths and Architectures for Parallel Processing (2011). pp. 235-244.

[10] Dung, T., N, Ho, T., B., Shimodaira., H. *A Scalable Algorithm for Rule Post-pruning of Large Decision Trees*. Advances in Knowledge Discovery and Data Mining (2001) pp 467-476.

[11] Fudzee, M., F, Abawajy., J. *Management of Service Level Agreement for Service-Oriented Content Adaptation Platform*. Network and raffic engineering in emerging distributed computing applications (2012) pp 21-42. ISBN- 1466618892.

[12] ITU-T Standards for Video Encoding – "*Subjective video quality assessment methods for multimedia applications*," ITU-T Recommendation P.910, April (2008).

[13] Ismail, M., N, Fudzee, M., F, Ibrahim., R., Jofri., M., H. *Video Streaming Energy Consumption Analysis for Content Adaption Decision-Taking*. Journal of Telecommunication, Electronic and Computer Engineering (2017). ISSN: 2180-1843.

[14] Tarkoma. S., Sikkinen. M., Lagerspetz. E., Xiao. Y., *Smartphone Energy Consumption: Modeling and Optimization*. University Printing House Cambridge 2014.