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พลังงานและแหล่งกำเนิดพลังงานไฟฟ้า

Energy and Electrical Energy Source

พลังงาน เป็นปริมาณพื้นฐานอย่างหนึ่งของกระบวนการในระบอบกายภาพทุกอย่าง พลังงานที่สภาวะหนึ่ง ๆ นิยามว่า เท่ากับงานที่ต้องใช้ในการเปลี่ยนจาสภาวะแรกเริ่มไปยั้รสภาวะนั้น ๆ ตัวอย่างของพลังงาน ได้แก่ พลังงานไฟฟ้าในแบตเตอรี่ พลังงานเคมีในอาหาร พลังงานความร้อนของเครื่องทำน้ำร้อน หรือพลังงานศักย์ของน้ำที่อยู่เหนือเขื่อน เป็นต้น พลังงานสามารถเปลี่ยนรูปจากรูปแบบหนึ่งไปสู่อูปแบบอื่นได้ โดยกฎการอนุรักษ์พลังงานระบุว่า ในระบบปิดนั้น พลังงานทั้งหมดที่ประกอบขึ้นจากพลังงานของส่วนย่อย ๆ จะมีค่าคงที่เสมอ พลังงานที่ว่านี้ไม่สามารถจะทำให้สูญลอยหายไป เว้นแต่ว่าจะแปรเปลี่ยนให้อยู่ในรูปของพลังงานในรูปแบบอื่น ยกตัวอย่าง เช่น การเปลี่ยนพลังงานแสงอาทิตย์ให้เป็นพลังงานไฟฟ้า โดยโซลาร์เซลล์ การเปลี่ยนพลังงานสะสมของน้ำที่เก็บไว้ในเขื่อนมาเป็นพลังงานกลเพื่อใช้ขับเคลื่อนเครื่องกำเนิดไฟฟ้าของโรงไฟฟ้า เป็นต้น

ในบทนี้จะกล่าวถึง นิยามของพลังงาน การวัดค่าพลังงานและหน่วย แหล่งกำเนิดพลังงานไฟฟ้าในรูปแบบต่าง ๆ วิธีการผลิตพลังงานไฟฟ้าเพื่อใช้งาน การส่งจ่ายกำลังไฟฟ้า และระบบผลิตพลังงานไฟฟ้าและความร้อนร่วม

1.1 พลังงาน (Energy)

พลังงาน หมายถึง ความสามารถในการทำงานได้ (The capacity for doing work) สิ่งต่าง ๆ ที่เคลื่อนที่ได้ หรือสิ่งใด ๆ ก็ตามที่เคลื่อนไหว เจริญเติบโต หรือทำงานอย่างใดอย่างหนึ่ง ย่อมมีพลังงานทั้งสิ้น ความร้อนก็เป็นพลังงานรูปหนึ่ง เราอาจมองไม่เห็นความร้อนเคลื่อนที่แต่ความร้อนทำให้โมเลกุลของสสารเคลื่อนที่เร็วขึ้น พลังงานนั้นอาจถูกเก็บไว้ได้ เช่น พลังงานที่อยู่ในด้านหิน ในน้ำมันเบนซิน หรือในกลไก พลังงานที่ถูกเก็บไว้ในสปริงสามารถนำมากใช้ได้ พลังงานสามารถเปลี่ยนรูปได้แต่ไม่สามารถถูกทำลายหรือสูญหายไป ดังนั้นแล้วมันถูกเปลี่ยนจากรูปแบบหนึ่งไปอีกรูปหนึ่งเท่านั้น พลังงานมีหน่วยวัดเป็น จูล (Joules) หรือ กิโลวัตต์-ชั่วโมง (kWh) พลังงานมีหลายชนิด ได้แก่ พลังงานศักย์ พลังงานจลน์ พลังงานเคมี พลังงานความร้อน พลังงานเสียง พลังงานแสงหรือรังสี และพลังงานไฟฟ้า

1.2 พลังหรือกำลัง (Power)

พลัง หรือ กำลัง คือ อัตราการทำงานหรืออัตราที่พลังงานถูกใช้หรือเปลี่ยนรูปไป เช่น เครื่องยนต์ใช้พลังงานจากน้ำมันดีเซล เครื่องปั่นขนมปังใช้พลังงานไฟฟ้า หรือกังหันลมใช้พลังงานจากลม อัตรากำลังนี้มีหน่วยเป็นวัตต์ (W) หรือ กิโลวัตต์ (kW)

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Clifford Lane



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